

D U R H A M / Y O R K

RESIDUAL WASTE STUDY

GENERIC HUMAN HEALTH & ECOLOGICAL RISK ASSESSMENT STUDY

Faith United Church
Courtice


**JUNE 27
2007**



DURHAM-YORK RESIDUAL
WASTE STUDY
GENERIC HUMAN HEALTH
AND ECOLOGICAL RISK
ASSESSMENT STUDY
WEDNESDAY JUNE 27TH, 2007
FAITH UNITED CHURCH,
COURTICE



FACILITATOR: Good evening and welcome to Courtice. I am Ron Kervin. This is one of a number of sessions that we have held in York Region and in Durham Region over the past week or so. I would like to introduce Angelos Bacopoulos, the Project Manager for the study who will introduce members of the panel and others. We will then have two formal presentations, one on the status of where we are in this particular project and then a presentation on the Generic Human Health and Ecological Risk Assessment study itself. Then we will have a formal question and answer period.

ANGELOS: Welcome. I am the Project Manager for the EA Study that York and Durham Regions are conducting jointly to find a solution to the management of the residual waste that both Regions will have after the full implementation of their waste diversion program. I would like to welcome all of you as well as Rogers TV who are taping this session. You will be able to see it at a later date.

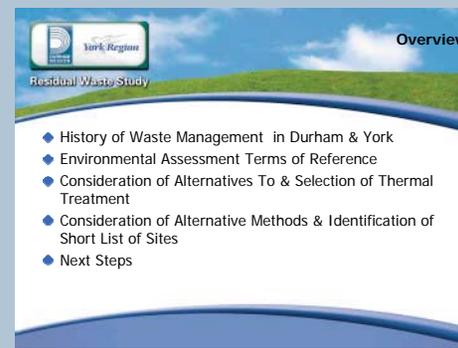
I would like to acknowledge the presence of your Regional Councillors. Councillor Mary Novak, Regional Councillor for Wards 1 and 2. Regional Councillor Charlie Trim who is

the Ward Councillor for Wards 3 and 4. Both Regional Councillors are here not only to hear the presentations, but also to hear your comments, so they can go back and make informed decisions on what to do with our residual waste and how we are to manage it once we have exhausted our diversion programs.

As Ron mentioned, there will be two presentations and there are two panels that are here to answer your questions tonight. On the first panel we have Dr. Lesbia Smith and Dr. Chris Ollson. Dr. Smith is a Medical Doctor. She has over 30 years of experience in public health related to the environmental and occupational health areas of the public health regime. Her company provides consulting services to a diverse client base, including all levels of government in Canada. She is an Assistant Professor in the Department of Public Health at the University of Toronto. Dr. Chris Ollson has 11 years of experience in the public health field. He is the National Director of Environmental and Occupational Health Sciences for Jacques Whitford, which is one of the two main consulting firms working for both Durham and York Regions on

this Environmental Assessment Study. Dr. Ollson has a Ph.D. in Environmental Science, specializing in environmental toxicology and risk assessment. He holds an adjunct Professorship at the Royal Military College of Canada and Memorial University. So, we have two very qualified people here to direct your questions to and hopefully you will get some straight answers from them.

I mentioned there are two major consulting firms that are working together on this project. The two leads are GENIVAR and Jacques Whitford. There will be a secondary panel, which will include some members of those two consulting firms. On this panel is Jim McKay. Jim is the Project Lead for Jacques Whitford on this Environmental Assessment Study. We also have Dave Merriman who is the Project Director for GENIVAR. We also have Mirka Januszkiewicz, the Director of Solid Waste Management Services Division from the Region of Durham. As well, we have in the crowd Cliff Curtis, who is the Commissioner of Works for Durham Region. Cliff is here as well, if there are any questions related on a regional basis, but hopefully Mirka should be able to address most of those. Before we begin, I would like to call on



Councillor Mary Novac to come up and give a welcome on behalf of the Municipality of Clarington.

COUNCILLOR NOVAK: Thank you. Welcome everyone to this session and I certainly encourage all of you to ask any questions you may have. We have a good team here and they are willing to answer everything. On behalf of the Municipality of Clarington, some of the Councillors are at a variety of different functions tonight and the Mayor, I understand, will be attending. Please feel free to ask any questions during this session.

ANGELOS: Thank you Councillor. Just two minutes ago, Dr. Boris Weisman came in and he will be on the secondary panel. Dr. Weisman works for GENIVAR as well. He did all of the air modelling analysis for this Study and is able to answer questions in that particular area.

FACILITATOR: Thank you. I would like to turn this over to Jim McKay from Jacques Whitford who will let us know where we are in the EA process and what activities have been occurring in that regard.

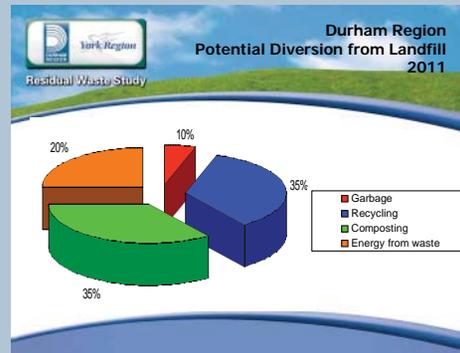
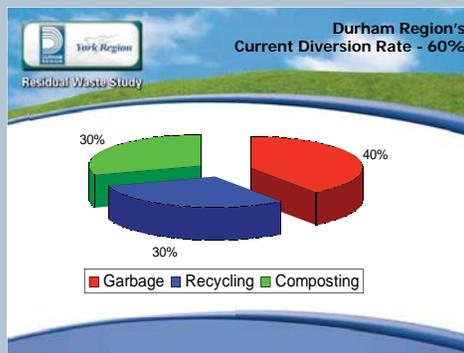
JIM: What I am going to do over the next few

minutes is give a background of where we are at with the EA Study. One of the comments that we have been getting from a lot of people is that they are new to this process and they don't understand some of the decisions that have been made in the past. So at each one of these open houses that we have from now on, I will give a quick introduction as to where we have come from, where we are at and where we are going in the future.

Just an overview of what I am going to show you tonight, is a history of waste management in both Durham and York, what eventually led up to this EA process, what an Environmental Assessment Terms of Reference is that guides this Study and then the consideration of 'Alternatives To', which is essentially the different types of technologies that we have looked at, the siting process we have gone through and then the next steps.

First of all, to give you background as to what happened in the past and what has led up to this EA process, there were the landfill partnerships with Toronto, including the Brock West Site and Pickering in the 1970s to mid 1990s and the Keele Valley Site in Toronto. That is the big landfill site where a

lot of the GTA's waste, in particular the City of Toronto's waste, went into Vaughan. This was followed by the Interim Waste Authority, the big landfill site search that happened in the early 1990s. The Adam's Mine site, the site that was identified in Kirkland Lake where the proposal was to rail haul the garbage up to Adam's Mine from the GTA. Now this is where we are at today, with the export of the bulk of the waste from the GTA going into Michigan. That export will stop, at least the municipal waste will stop on December 31, 2010. In addition to the different disposal activities that have occurred in the past, both York and Durham Regions have been working quite hard on developing the other side of the story, all of the different types of diversion programs. They have both developed their own long-term strategy plans for how they are going to increase recycling and composting, what the different programs are that they are going to roll out over the next couple of years and how they are going to do that. Both of those strategy documents are available on their websites and the Durham Region Waste Diversion Strategy is also available in hard copy at the back if you would like a copy.



Need & Purpose of Undertaking

- ◆ To process - physically, biologically and/or thermally - the waste that remains after the application of both Regions' at-source waste diversion programs in order to recover resources - both material and energy - and to minimize the amount of material requiring landfill disposal.
- ◆ In proceeding with this undertaking only those approaches that will meet or exceed all regulatory requirements will be considered.

Just to give you an overview of where Durham Region is at today, this is a breakout of the diversion rate, essentially the amount of material that is being diverted from landfill. You can see about 30% is being captured by the Blue Box Program right now. With the introduction of the Green Bin Program, it's been extremely successful in reducing the amount of waste going to landfill, representing about 30% of the diversion right now. This has resulted in a diversion rate at about 60%, which is one of the best in the Province. Durham should be extremely proud of hitting a diversion rate that high. That being said, there's still 40% that something has to be done with. Right now, that 40% is going into Michigan, with a small percentage from Brock going into the Brock Site.

The goal, where they want to be in 2011 when the border closes to Michigan, is to increase additional recycling beyond what it is already. Get it up to 65%, get another 5% out of their organics program with some additional rollouts and get up to 70% diversion there. Also, they are looking at using the energy from waste (EFW) facility to obtain a volume reduction that you can achieve by combusting this waste, reducing the volume and thereby

reducing the amount of landfill capacity even more. At the end of the day, they are hoping to only send about 10% of the total waste stream into a landfill site.

Why did we get into this? What is it we identified? What was the need and what was the purpose of going through this whole EA process? Well, we wanted to look at different ways to manage the long-term waste that both Durham and York generate. We wanted to look at different alternative technologies, physically processing it, biologically processing it, or thermally processing it, but only the waste that remains after the Blue Box Program and the composting program, so that we are not competing with those programs. This is only to manage the waste after diversion. And also to look at that waste, not as garbage, but as a resource, as a useable resource that you can recover additional materials out of that are in that garbage stream today. In the future, there are additional metals in there that could be recycled, could be captured and we could also look at recovering energy. Think of this as a potential energy product we could use to create electricity, heat and potentially steam. Ultimately reduce the reliance on

landfill and minimize the amount of material going into a landfill site. We also said right from the beginning that anything we consider through this process has to be able to meet the regulatory requirements in the Province of Ontario so that we are not going down a road with the technology that won't be able to be approved and permitted in the Province.

So where did we start? First of all, when you start an EA process you have to develop a Terms of Reference. An EA Terms of Reference is essentially a road map or a guidance document as to how you are going to complete your EA Study. It outlines the different methodology that you are going to use or the different processes you are going to follow to identify different technologies and evaluate those technologies, identify and evaluate sites. It essentially outlines the instructions as to how you are going to do this. You take that document and there are a lot of back-up documents that provide a lot more detail, submit that to the Minister of the Environment along with the Record of Public Consultation. When we developed our Terms of Reference, we did a lot of consultation with the public asking for input about how we should go about this evaluation process. You



Environmental Assessment Terms of Reference

Residual Waste Study

- ◆ EA Terms of Reference Document
- ◆ Background Documents
 - Purpose & Need for the Undertaking – Quantities & Composition
 - Consideration of Alternatives To – Technology Selection
 - Consideration of Alternative Methods – Facility Siting
 - Description of the Environment Potentially Effected
 - Approvals Requirements
- ◆ Record of Public & Agency Consultation

Consultation During Preparation of EA Terms of Reference

Residual Waste Study

- ◆ 35 Public Meetings and events to discuss the EA Terms of Reference
- ◆ Agency input to Draft EA Terms of Reference
- ◆ Public Polling on key issues
- ◆ Six members of the public along with elected officials on JWMG direct project

Consideration of Alternatives To & Selection of Thermal Treatment

Residual Waste Study

- ◆ Study of Additional At-Source Diversion
- ◆ Formulation of Alternatives Disposal Systems
- ◆ Six Public Meetings on Alternatives & how they will be evaluated
- ◆ Technical Studies of the alternatives
- ◆ Studies of environment potentially effected
- ◆ Six Public meetings on evaluation of alternatives & conclusions

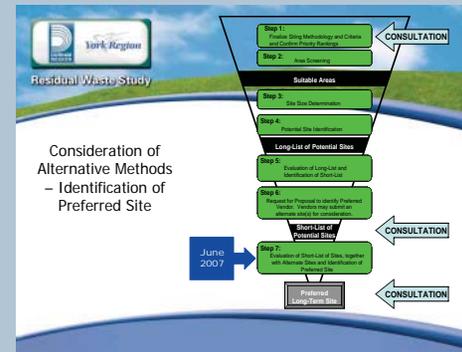
submit that to the Minister of the Environment and get approval from the Minister before you actually proceed into your Environmental Assessment.

For the preparation of the Terms of Reference document itself, there were 35 public meetings that were held to discuss the Terms of Reference. We talked about the technology process. We talked about the siting process. We had a workshop on consultation where we asked the participants in those workshops how they would like to be consulted through the EA process, the timing for issuing of notices, what type of venues they liked, whether we should be notifying them via radio, newspapers, TV, all the different forms of media that could be used. We did some public polling using Ipsos Reid, who did some online polling to get a different type of perspective. We also established the Joint Waste Management Group, which is the body that administers this entire project. It has public and political representatives on it. There are four political representatives from Durham, four from York. There are also three public representatives, members of environmental advisory committees, but public citizens that represent both Durham

and York Regions, three from Durham and three from York.

Once we had our approved Terms of Reference we had to start evaluating the different types of technologies, what we call the 'Alternatives To' evaluation. Essentially what we were doing was looking at all of the different types of technologies out there that we could use to process the waste and meet our need and purpose. We want to process the waste. We want to reduce the volume going to landfill and we want to recover material and additional energy. In doing that evaluation process, we looked at a number of different things. First of all, we did a study of the diversion, where it stands right now and what is achievable. We looked around the world to different municipalities and what types of diversion rates they have been able to achieve. Some of the highest diversion rates are in Europe right now. So, we looked at those programs to find out what they are doing and how they are doing it to see if the 60% diversion target that we have set and then the 75% diversion target later on is aggressive enough. Has anybody been able to meet that target to date and should we potentially be putting it even higher? We

also looked at the different types of disposal systems, so we didn't look at technologies in isolation. We didn't just look at physical processing. We looked at physical processing and thermal processing because each of these different types of technologies work together in a systems context. We put them together into systems and then went out and did a lot of public consultation and we held a number of public meetings again. We also did a number of background technical studies on the different types of technologies, where they are being used, how efficient they are, the types of emissions coming out of these facilities, all the different types of technical background. We looked at the potential environmental effects, in reference to facilities around the world. We looked at what the emissions are coming out of them, what they are doing to ensure protection of the environment around existing facilities and we also looked at the types of environments that exist within Durham and York Regions and what the potential impacts might be from this type of facility. We went back out and consulted again once we had reached our conclusion on what the preferred technology should be.

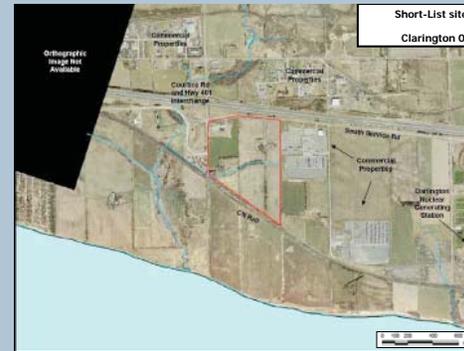
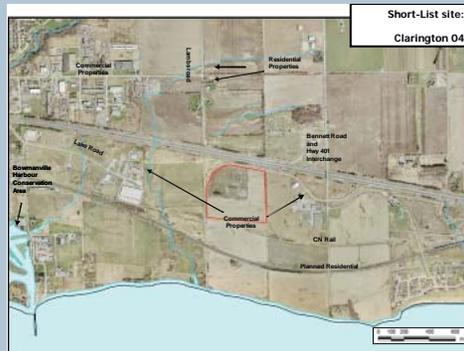


These are the four options we looked at. First of all, Option 1, mechanical biological treatment, with the recovery of a biogas and then the landfilling of a stabilized residual. There has been a lot of press lately about stabilized landfills. This is the stabilized landfill option where you take your black garbage bag, you rip it open and you pull out additional recyclable materials. You then compost or digest the organic material that is left in there and then you landfill that stabilized organic material. The other three systems, the Option 2 Systems, were variations of a thermal treatment option. This is where we looked at thermal waste, where you combust the waste or different types of thermal treatment processes and then recover metals off the backend of the process. We looked at different processes where you open up your garbage bags before you thermally treat the waste and pull out additional recyclables. Then you create what we call a solid recovered fuel and then combust the fuel product. We also looked at a hybrid of all three, where you would process the material at the front end, you would combust some of the material and you would landfill some of the material as a stabilized residual. We looked at a number of different options like that.

The preferred system that ultimately came out was a thermal treatment process where you would thermally treat the waste and recover materials off the backend, additional recyclable metals for the most part. We also left on the table the system, which involves the front end processing of a material where you create a solid recovered fuel and thermally treat that fuel product. We wanted to leave both of them on the table and then go out to the vendors of these different types of technologies for more input back from them.

Once we knew that thermal treatment was the preferred option, it allowed us to get into our siting process. First of all, when we did our Terms of Reference, we had to put in the Terms of Reference the process that we were going to use to identify the site for a particular technology. However, at the Terms of Reference stage, we didn't know what that technology was. So, our commitment in the Terms of Reference was, once we know exactly what this technology is and what the requirements of this technology are, we will go back out to the public and confirm that the siting process that we identified about a year prior to that is still

applicable to what we wanted to do. That happened through a series of public meetings in September 2006. Then through the use of modern Geographic Information System (GIS) we could use a computer database to start screening out particular areas of both Durham and York Regions that are unsuitable to site this type of facility. So, you wouldn't put this type of facility in the middle of a residential neighbourhood. We identified all the residential neighbourhoods throughout Durham and York and screened those out from consideration. If you think of the computer model, you just keep overlaying different layers, so you add on the residential layer, then you add on the institutional layer, you add on protected wetlands and sensitive natural habitats and keep adding the layers on. What you are left with is a relatively small area within Durham and York where you might actually be able to site one of these facilities or that might be suitable to consider moving forward in siting one of these facilities. For the most part, those areas followed along the 401 corridor, up the 404, along the 407. If you think of where the bulk of the industrial and commercial lands exist today, those are the types of areas that came out of this process. We also had to



Note: Location is within the Greenbelt. Existing site specific industrial land use allowed to continue and future planning approvals are not required to conform with Greenbelt Plan. Subject to further consultation.

identify how big of a site we needed. So, we developed a conceptual drawing of what this facility would look like, determined that we required about 20 to 30 acres in order to site this facility and then once we knew roughly where it could be and the size we needed, we could actually go out and start identifying sites. We went through a couple of different processes to identify those sites, both private sites and publicly owned sites and came up with what we call the Long-List of sites. Once we had the Long-List of sites, then we went through a little bit more detailed evaluation process to start screening out unsuitable sites. We started looking at the sites in terms of how close they were to the infrastructure. This is a facility that generates electricity. We need to be able to get the electricity from the facility itself, out into the electrical grid, so how far are you going to have to run lines in order to access that grid? You have to get trucks into your facility. What is the landuse that you have to drive those trucks through, are you going to be driving through a residential neighbourhood to access your site and do you want large tractor-trailers full of garbage driving through those neighbourhoods? We started looking at it from that perspective and eliminated

further sites. We ended up with the Short-List of sites and that is essentially, where we are at today. We have a Short-List of sites. We are going through a very detailed evaluation process of each one of these sites now and we are also consulting on these sites, looking for comment and feedback.

These are just some aerial photographs of each one of these sites. First of all, the 01 site in Clarington is in the Energy Park, at the corner of Courtice Road and Hwy 401. I'm sure you are all familiar with where these sites are by now. The second site is over to the east at Bennett Road and Hwy 401, between Lambs Road and Bennett Road. This is a privately owned site. Another privately owned site is back in the Energy Park at Courtice Road and Hwy 401. The final site is up in East Gwillimbury. This is the one York Region site, located, if you see on the left hand side of the slide that's Hwy 404 and Davis Drive, along the bottom of the slide is where you would be able to access the 404. The large white building just next door to the red rectangle is York Region's new recycling facility, so all the blue box material that is generated in York Region goes into that recycling facility right now for processing. Each one has some

advantages and disadvantages. One of the notes on this site is that it is in the Greenbelt area right now. The anomaly associated with this site is that it is in the Greenbelt, but it's not subject to any of the development requirements within the Greenbelt because of existing approvals that were in place before the Greenbelt Plan was enacted.

For those of you who attended the last presentation I gave here about a month ago on the Short-List of sites, you will notice some differences. There are two sites that have been removed. First of all, the Clarington 02 Site, which is the site in the Energy Park between the rail line and the lake, right at the bottom end of Osborne Road. That site has been removed. The reason for it being removed is because of its Official Plan designation. While we were going through our process, that designation was in question and was under an appeal process. Just a couple of days before we announced our Short-List that appeal process was completed and the deferral on the designation was lifted. It's a very complicated way of saying it's designated as greenway, as a landuse and therefore it doesn't meet our screening process and we had to remove



Removal of 2 Short-List Sites

Residual Waste Study

- ◆ Clarington 02 – REMOVED
 - Official Plan Landuse Designation does not comply with Step 2 Area Screening Process
- ◆ Clarington 03 – REMOVED
 - Site originally offered by “Willing Seller”
 - Owner has since withdrawn site from further consideration

Next Steps

Residual Waste Study

- ◆ Studies of short list sites – Ongoing
- ◆ RFP for potential facility vendors - June 2007
- ◆ Consultants conclusion on preferred site - September 2007
- ◆ Council Selection of site for Facility – End 2007
- ◆ RFP for facility vendor - Early 2008
- ◆ Select Vendor for facility - Mid 2008
- ◆ Submission of EA - Late 2008
- ◆ MOE & Other Approvals granted – 2009
- ◆ Construction of Facility Mid 2009 to 2011

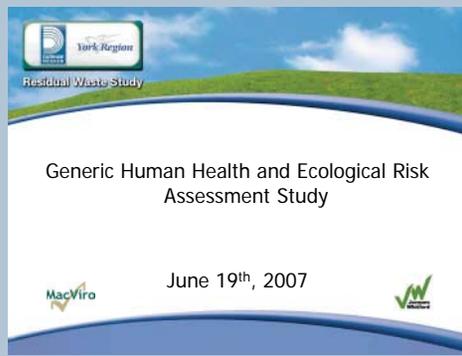


that site from the list. The second site is the Clarington 03 site, again at Bennett Road and 401 interchange, this is the property on the west side of Lambs Road. This is a privately owned property that was offered up by the seller, the owner wanted to participate in this process. A few weeks after that the owner approached Durham Region and said that they do not want to participate any longer. They wouldn't then be considered a willing seller under our process and we had to remove that site from the list as well. So, the Short-List is now a little bit shorter. Finally, where are we going from here? We have a lot of detailed studies ongoing right now. If you live near these properties, you will see people out near these properties and out in your areas as well. We will be going out and setting up meteorological stations in these locations. We can start collecting the existing air quality data to determine what the baseline air quality conditions are around these sites. From that we can determine, if we were to put this facility here, what the additional loading would be to the existing air quality. We will be out doing archeological assessments and land use assessments. If you live in these areas, for the next couple of weeks, you may see somebody driving

down the road with a flashing yellow light. They are going out and doing an inventory of all those properties that exist, where the different houses are, the barns, the sheds, all the different structures that exist and what they are being used for. In parallel to the whole EA process, there is also a competitive process that's going on that includes going through a qualification process and then a proposal process to identify the preferred technology vendor. We know it is going to be thermal treatment of some kind, but we don't know what the specific technology is within thermal treatment. There are many different types. There are the traditional combustion type processes, which most people call incineration. There are gasification processes. There are plasma gasification processes. All of these new and emerging technologies that are out there and are starting to prove themselves. All of those different types of technologies will be allowed to bid on this type of process and prove that not only are they qualified to do this, but they could come in and build this type of facility and operate within York or Durham Region. On September 25th, our goal is to announce the Consultant's recommended site. By then, we will have all of our detailed

evaluation done and we will present what we, the Consultant Team, conclude should be the preferred site to locate this facility. That will be coming out in late September and we will be coming out with another full round of consultation to make everyone aware that we have announced what the preferred site is and to again provide another opportunity for input on that preferred site.

What happens after we announce the preferred site is we will submit our EA documentation, which will document the whole evaluation of technologies and the evaluation of sites. And then there is another whole level of approvals processes that we have to go through. The Environmental Protection Act (EPA) approvals will happen in about 2008. So then, our EA document will be submitted, we're hoping in December of 2007. You will have an opportunity to formally comment through the MOE on that document. While that comment period is going on, we will be undertaking an even further level of detailed evaluation studies on the preferred site to satisfy all of the EPA requirements. It's the EPA that actually issues the license to operate these facilities, what they call a Certificate of Approval. All that



being said, it's a very long approvals process. We've come a long way, but still have a long way to go. What we are planning for and what we are really hoping we can achieve, is to have facility construction start in 2009. If we can hit the 2009 date to start constructing this facility, we will have the facility up and running by the time the border closes to Michigan and we won't have a gap where we don't have any landfill capacity. There will be contingency plans in place, but it would be nice to have this facility up and running when that border closes. Thank you.

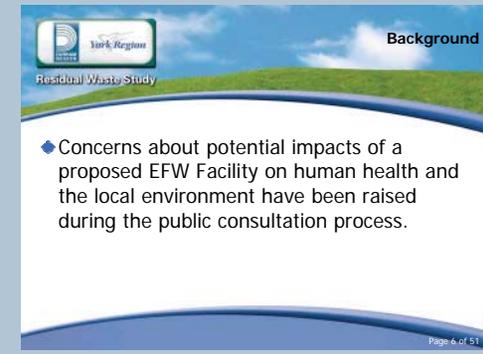
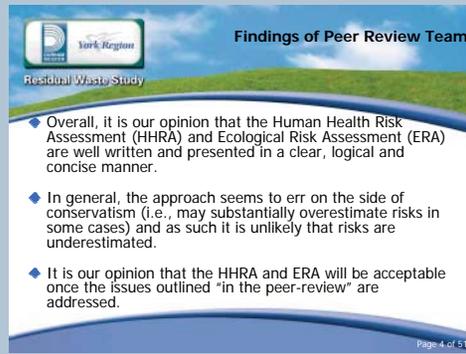
CHRIS: Thank you for coming out tonight. Some of you were here last week as we started unveiling this study and it's great to see you again. For those of you who haven't seen this presentation yet, welcome. Jim has taken us through the EA process and where we have been and how we have gotten this far over the last few years in the EA process. Around the fall of last year, the questions started coming to me on the health side, how are we going to predict what the potential health risks to people and the environment would be from a facility? This poses a number of challenges because we don't have a site picked out yet and we don't

have a technology picked out. I will take you through today how we are starting to address that. This report was released last week to the Joint Waste Management Group. They formally accepted the report on Tuesday, it's been posted on the Residual Waste Study website, since last Tuesday. We have held a couple of open houses so far and this is just the second last in this series. I will take you through what we did and how we got there.

As with any study there are a lot of people involved in a study such as this. You can see on the left, the team from Jacques Whitford, that's the health and ecological team, the group working with me to get this study put together. On the right are representatives from GENIVAR, formally MacViro. They changed the company name when they were bought by GENIVAR recently. They did the air modelling of what would come out of this facility.

In any type of health study like this, we don't do these studies in isolation and then come to the public and bring it to Council and say, "here are the results of the findings". These studies get peer reviewed. This is an independent peer review and Dr. Smith

is here today as one of those independent peer reviewers. She really did the review from a public health standpoint. Intrinsik, formally called Cantox, did the actual detailed technical review of the report. They are also risk assessors and they are specialized in this field as well. We had them go through the report. At the end of the day the peer review was done, but we commissioned that peer review. So, that was a peer review team that I had asked for and selected independently, but that was paid for by the Region and they are still part of this Study Team. But just to give you some assurances, they have already had a first crack at this for peer review. And briefly, what the Peer Review Team found was basically three major bullets. The first one is that overall, the report was presented in a clear, concise, logical manner and it was well written. That was good; we were happy to see that. The second one is a very critical point. The Peer Review Team found that if anything we erred too much on the side of caution. I would rather be on the side of caution and be conservative. I would rather be faulted for being cautious and conservative. We were happy that they faulted us on those points. The third point is that this peer review wasn't just these three bullets. It was



around 11 pages, give or take a peer review comment. Some of those very technical detailed questions needed to be responded to and they found if we could get agreement on those technical issues, then at the end of the day they could sign off, say they believed the findings, and can support the findings of the project. That has occurred. Dr. Smith will give you her opinion on the peer review after I am done my presentation.

Why do this study? Again, not only was the EA Team coming to me asking what the potential health effects might be or the environmental impacts from having such a facility in York and Durham, it was also folks like you that were coming to the public meetings and those questions continually coming up, and there weren't any answers. Knowing that we don't have a site, knowing that we don't have the preferred technology yet, what are we going to do to address that specific to Durham and York Regions? That was the genesis of this report. That was the reason for getting this going. So what do we know? There is a lot of information out there, but these are two things that we do know in terms of health affects or potential health impacts from this type of facility. The

first was when the MOE did their own study in 1999, during which they looked at both landfills, as well as incinerators and asked if we were to have a landfill or an incinerator near a suburban neighbourhood, would that pose a potential health risk as well as an environmental risk? They concluded overall that there are some issues and flags raised there but it would be acceptable in 1999, given the technology at the time, to site one of these facilities anywhere in Ontario, with some caveats. There is only one operating EFW thermal treatment plant right now in Ontario. It's in Brampton, just off the 407, just south of the 407. That facility went through an upgrade given the new air regulations that changed. There was a risk assessment done by Cantox at the time, now Intrinsic, who was on the peer review team. They did a risk assessment of that facility with the upgrades and proposed changes. They determined at the time that there would not be a residential health impact from that facility itself. So that was a specific facility, specific site, they knew where everything was and what was coming out. Also, I don't want to make too much out of this, but you have heard this before, in North America and other jurisdictions including Ontario, in

Europe and Japan they are operating these facilities on what they believe to be stringent environmental regulations and law. So, that is what we know.

Overall, the study objective was to take a look at this thermal treatment option. They don't know how much garbage they want to put in one of these facilities yet either. As Jim showed you, we have all of the diversion pie charts, but at the end of the day, we are not sure how much garbage is going to go in. What we do know is that the EA Study is only looking to see at most 400,000 tonnes of garbage going into one of these facilities a year, over a 35-year period. So, that is what we used as the basis. Let's take the maximum amount of garbage going in one of these facilities and we know that the facility has a 35-year operating life. Let's see if we can come up with a way to predict the risk. There are really five detailed study scope objectives. The first was to conduct a multi-pathway human health and ecological risk assessment. What does that mean? It means when you have emissions from a facility like this they go into the air and you breathe those in. But that is not where your exposure stops. For some of the chemicals that would come

Background

Residual Waste Study

What Do We Know?

- ◆ Previous Health Reports on EFW technology in Ontario concluded no unacceptable risk to either human health or the environment
 - MOE (1999) – Environmental risks of municipal non-hazardous waste land filling and incineration
 - Cantox Environmental Inc. (2000) – KMS Peel EFW Facility Expansion
- ◆ Municipal solid waste thermal treatment EFW facilities are being operated in an acceptable manner in North America, Europe and Japan under strict environmental regulation and law

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Study Objectives

Residual Waste Study

- ◆ To assess the potential health and environmental impact of siting a Municipal Solid Waste (MSW) thermal treatment EFW facility (up to 400,000 tonnes/year) in the Durham/York Region

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Study Scope

Residual Waste Study

- ◆ Conduct a multi-pathway risk assessment based on potential chemicals emitted from a generic EFW facility;
- ◆ Examine Human Health risk based on different land use scenarios;
- ◆ Determine acceptability of MOE Guideline A-7 Combustion and Air Pollution Requirements and potential associated risk;
- ◆ Provide information to public regarding health/environmental concerns from emissions of EFW facilities;
- ◆ Generate model for use in future Site Specific Risk Assessment (SSRA) for the facility.

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Overall Study Limitations

Residual Waste Study

- ◆ This study has a number of limitations and does not replace the need for a site specific risk assessment
 - Thermal treatment EFW Facility location – TBD;
 - Final technology and vendor – TBD;
 - Air modeling completed on a regional scale – not site specific;
 - HHERA completed on a regional scale – not site specific;
 - This report is meant as a feasibility study only with the purpose of identifying potential issues of concern for inclusion in a SSRA;

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out of a facility like this, you also have these things being deposited on the ground over this 35-years that the facility would run. It's going to get into the food chain, it's going to get into the water and it's going to get into other environmental media. The question is, is it at a concentration that we should be concerned about? We wanted to look at different land use scenarios. Once again, if you look at the Cantox study that was done in 2000, they knew where the facility was, they knew where people lived and so they were able to predict knowing where everybody was. We don't know that yet, so we looked at a number of different scenarios of where people would live and how that would impact their health.

There is a lot of discussion about the MOE and if their standards are stringent enough. This comes up quite often and you will hear both sides of that story. Some people will tell you they are and some people will tell you they are not. So what we looked at in this facility was if the emissions from a facility like this were coming out right at the guideline, right at the maximum allowable concentration they would let you emit, let's see if that actually poses an acceptable or unacceptable risk. This is the starting point for discussion

in my mind with the public, with Councillors, with whoever wants to start talking about health. What you are going to see tonight is not the final answer. It's a starting point. It's meant to be a discussion, it's a side of the story and it's how we feel that if we move forward, what would the precautions be for things you have to worry about. And at the end of the day, it takes a while to get all of these models up and running and get everything laid out. If the Region gets to the point where they decide that they are going to move ahead, they are going to get a site and they're going to get a vendor as Jim says, and everybody is putting in their bids for these types of things, the model is ready to go. The air modelling is ready to go and it just makes the process a little bit faster once we get to the site-specific side because we have already worked out the details on the modelling. Any study like this has limits; of course, we don't have a site or a vendor so our study has limitations. This is the starting point for discussion. Some of the limitations are that we don't have a site and we don't have a vendor yet. So, what do we do about that? We came up with a generic risk assessment for one of these sites. The air modelling was done on a regional scale because you don't

know exactly where that site will be. We looked at the regional air data, the regional wind patterns and the modellers looked at snowfall and rain events and things like that. As you get to a site-specific assessment, you would get a lot more information and as Jim said, that information is being collected right now. Again, it's a feasibility study. It is only meant to be a starting point and get us going.

We feel as the Health Study Team that overall, you could site a facility like this, an EFW facility in York or Durham Region as long as five things occur. We call them the "five Ps". So long as it's properly designed, properly operated, properly maintained, the proper oversight is there and the proper regulation. And by oversight, I don't necessarily mean government oversight. By oversight, I mean folks like you. So, if those five "Ps" are done, then we believe that it would be acceptable to do this and I will take you through how we came to that conclusion.

We had to create a generic facility and as much as I say we don't know who the vendor is right now, the air modellers and the process engineers on the team have a pretty good handle on what a facility like this could



Overall Study Conclusion

Residual Waste Study

Overall, it was concluded that a thermal treatment EFW facility could be sited in the Durham/York Region if the process invokes the 5 Ps:

- proper design **D**
- proper operation **O**
- proper maintenance **M**
- proper oversight **O**
- proper regulation **R**

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The Generic Facility

Residual Waste Study

MacViro

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The Generic Facility

Facility Size Scenarios:

- Operating Scenario 1: 400,000 t/y
- Operating Scenario 2: 266,666 t/y
- Operating Scenario 3: 133,333 t/y

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Chemicals of Potential Concern

Residual Waste Study

Chemicals of Potential Concern (CoPCs)

Metals	Chlorinated Monocyclic Aromatics	Chlorinated Polycyclic Aromatics	Polycyclic Aromatic Hydrocarbons	Volatile Organic Compounds
Arsimony Arsenic Barium Beryllium Boron Cadmium Chromium Cobalt Lead Mercury Nickel Selenium Silver Strontium Zinc	1,2-Dichlorobenzene 1,2,4-Trichlorobenzene 1,2,4,5-Tetrachlorobenzene Pentachlorobenzene Hexachlorobenzene 2,4-Dichlorophenol 2,4,6-Trichlorophenol 2,3,4,6-Tetrachlorophenol Pentachlorophenol	PCBs 2,3,7,8-TCDF Dioxin & furan	Benzo(a)pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)anthracene Chrysene Dibenz(a,h)anthracene Indeno(1,2,3-cd)pyrene Non-halogenated PCBs anthracene HP Naphthalene Phenanthrene	Benzene Chloroform Dichloromethane Formaldehyde Tetrahydrofuran Vinyl chloride

Notes:
 * Chemicals derived from Cantox Report for Human Health Risk Assessment for the Proposed Expansion of the MRF Plant, Inc. Brampton, Energy from Waste Facility (2005).
 * Chemicals also assessed by MOE in Environmental Status of Municipal Non-Hazardous Waste Landfilling and Incineration (1999).
 * Chemicals also included in GSC/MSRI-177 Conditions and/or Pollution Requirements for New Municipal Waste Incinerators (MRF 2004)

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look like. There are different technologies and in this case, we selected a mass burn thermal treatment. The other word for that is incinerator. We didn't look at some of these plasma type facilities or others, we basically modelled it on what the current Brampton facility is emitting today. What does it look like? To get a handle on it, if you take a facility like that, I believe that Brampton puts about 150,000 tonnes a year through their facility. We want to go up to 400,000 tonnes per year, so I can't just look at the Brampton report and say that Brampton said it was fine. Let's take a look at what happens. In the center there, that's the building, so it's just the type of facility. In this type of thermal treatment system there is a stack. There is typically one stack where the emissions come out. The garbage will go in, it will be burned, pass through the pollution control system, and then emissions will come out of the stack. There's really no water discharge from one of these facilities or other things; it is stack air emissions. We don't know how much garbage they want to put into one of these facilities a year, so we looked at three different scenarios to see if that would change things. 400,000 tonnes of garbage a year was the maximum we looked at that and took it at a third and

a third after that, so 266,666 tonnes give or take, as well as 133,333 tonnes per year.

There is a long list of chemicals that we looked at. There are more chemicals than what are on that list that would be coming out of a facility like this. There are several hundred at least that we know of that come out of a facility like this. In order to do this type of work, you have to get that list down to something reasonable. The way you do that is, if you had the vendor and you had the technology, they will give you the long list of chemicals, the 200 or plus chemicals that are coming from the facility and the rate at which they are coming from the facility. What we do in the Risk Assessment on the health side is we take that list, we look at the emission rates, we look at what the toxicity of those chemicals is. And then through a way of multiplying those things together we come up with what chemicals are going to pose the most risk from the facility. That is how we come up with a shorter list. Well, I don't have a facility, I don't have the long list, so how do we get to this list? We came up with this list. We started with what the MOE looked at in 1999, what were the chemicals on their list? That was the first basis. We wanted to make

sure that we had those chemicals on our list for the most part. We wanted to take a look at what Cantox put through in their risk assessment and this is essentially the list they looked at in their study from the Brampton facility. They did that actual toxicity screening out of the 200 chemicals coming out of Brampton and they came up with this list. Was that an appropriate list still? What we then looked at was the US EPA, which has a long list of emission factors for these types of facilities and the Europeans. We basically rectified that list against other lists that are out there. Essentially, you come up with this group of compounds. Is there a compound or two missing from this that you might see in a site-specific risk assessment? Absolutely. There could well be and that is something that you would deal with on a site-specific basis once you have your vendor. What are these chemicals and what are we looking at? The ones on the left are the metals, things like your arsenic, your cadmium, your chromium and your mercury; those will come out of one of these facilities. Just to the right of the metals are the chlorinated monocyclic aromatics, basically organic compounds that will be coming out of the stack from a facility like this. In the middle there, at the

Air Quality Modeling

Residual Waste Study

◆ Modelling included:

- 1-hour, 24-hour, and annual averaging periods at maximum point of impingement (MPOI – highest concentration outside fence line);
- Included estimates of particulate and vapour (gaseous) form of chemicals being emitted from the stack;
- Vehicular emissions for material delivery/ash disposal and local ambient air quality were also included.

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Air Quality Modeling - Results

Residual Waste Study

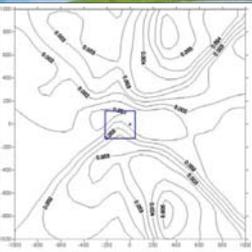
◆ MPOI (highest concentration) distance from stack.

Scenario	Distance of MPOI from Stack (m)					
	1-hour		24-hour		Annual Average	
	Particulate	Vapour	Particulate	Vapour	Particulate	Vapour
Scenario 1: 400,000 tonnes/year	728	728	316	316	381	381
Scenario 2: 266,666 tonnes/year	762	762	316	316	381	381
Scenario 3: 133,333 tonnes/year	728	728	316	316	316	316

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Air Quality Modeling

Residual Waste Study



Mercury Maximum Hourly Ground Level Concentrations

Based on emissions from EFW facility at Guideline A-7 limit

Mercury MPOI = 0.00583 µg/m³
(0.1% of O. Reg. 419/05 Schedule 3 standard)

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Air Quality Modeling - Results

Residual Waste Study

◆ Modeled air results for the 400,000 tonnes/year facility were below the MOE criteria for all chemicals

- including where background air quality was considered (e.g. NO₂)

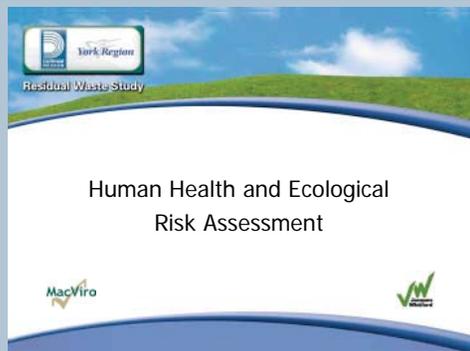
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top are the PCBs as well as the dioxins and furans. The 2,3,7,8-TCDD TEQ, really it's the acronym in a chemical basis for dioxins and furans, so they were modelled. Below that are the combustion gases, so things like the nitrogen oxides, the sulphurs coming out and the particulate matter. Obviously, there is a concern that any time you burn something you will have particulate matter come out whether it be from your woodstove or your car during the combustion process. So, particulate and those types of gases need to be examined. To the right we have the PAHs or the polycyclic aromatic hydrocarbons. Whenever you burn something, PAHs form. These PAHs, some of them on the top list there have the potential to cause cancer and we look at those as a group of compounds, and there are other PAHs that don't cause cancer, but they may cause other potential health impacts. Finally, at the end there is another list of organic compounds, things like the benzene and others.

So what did the modelling include? It looked at a one-hour, a 24-hour and an annual average. This is the data that the air modellers give back to us. Why do we get these three different time frames? They

give us the upper boundary of what would be coming out of one of these facilities, falling out onto the ground at the maximum concentration on a one-hour and a 24-hour basis. The reason we ask for those first of all, is that simply looking at inhalation, looking at breathing the stuff in isn't enough. Is there an acute health impact if you were to breathe this in and what is the worst-case scenario? While they are looking at it, you want to make sure that it's not going to pose an acute health risk, something that would be very short-term and would be an immediate thing. We look at the annual average so that we can look at the risk over 35 years of exposure. What we look at then is the annual averaging period of stuff falling on the ground at the maximum concentration and then we calculate it for 35 years. That's the longer term potential impacts. We use those numbers to find out what the potential long-term health impact is. It includes whenever you have something like this coming out of the stack, some of these things come out only as particulates, so a lot of the metals come out just as particulate. Some of the things come out only as vapours. So, things like benzene. You know when you stand there and you are gassing up your car that smell

and the fumes you are getting that's benzene. Benzene only comes out as a vapour, not as a particulate and there are some things that come out as both. Dioxins and furans both come out partially as a particulate and partially as a vapour. So, we look at all of those and they give us that data and the big thing with a facility like this is that you are going to have a great deal of truck traffic. If you were to look at just what's coming out of the stack of the facility when you are burning the garbage, that's one thing. But what we find in these types of facilities is that the truck traffic may cause more of an impact to the air shed for things like the nitrogen oxides, the particulate matter and others than would the emissions coming from the stacks. So, they included the trucks in this study as well. When I say they gave this the highest concentration at ground level, really the acronym we use for that is MPOI, maximum point of impingement. Really what that means is what is the maximum ground level concentration when it comes out of the stack and falls on the ground. Where is that and that is what we want to model. In a site-specific risk assessment, we know where the houses are, we know where the farms are, we know where the streams and rivers are.



We wouldn't necessarily just look at this. We would actually model the concentrations and the air modellers can do this to determine what people might truly be exposed to. This is a very conservative approach.

The people that we are going to be looking at all live where the maximum fallout of this is. This is simply a table that shows you where that maximum concentration would be in terms of the distance from the facility in meters. You can see on the one-hour maximums, it's a little bit further out from the facility. It is about three-quarters of a kilometer, about 750 meters. As you get into the 24-hour annual averaging period, the maximum concentrations for those contaminants fall out a lot closer. So, it's approximately 350 meters, 300 to 400 meters from the facility. The diagram that I have up here on the left is what we call an isopleth diagram and remember there is our generic facility and that's the fence line. We don't worry about what's inside the fence because that's dealt with by occupational health and safety rules and regulations. What we are concerned about is what happens outside of the fence line. The blue dot right here is the stack. Just to give you an illustration, when

the air modellers give us this data, this is what it looks like if you were to plot it out. So right about here is where we have the maximum concentration of mercury on an hourly basis coming out of a facility like that. That again is approximately 750 meters away and the first gut check you do when you get this stuff back from the air modellers as risk assessors is you take a look at the stuff and as I put it, make sure the world works the way it should. In this case, it does because as I said we used regional air data. Well, in this region of the world the winds predominately go to the northeast and at some point in the year they turn back and they start going southeast. We are seeing that the highest concentrations are falling out to the northeast and to the southeast. Things are moving with the wind pattern as they should be and you wouldn't have to do air modelling just to predict that. If it didn't work like that, we'd have some issues.

The first hurdle you have to get through in any facility like this or anything else where you are trying to get a permit from the MOE to operate one of these facilities and you are putting any air emissions out of the stack, is you have to make sure that you satisfy the

MOE. They have a list of criteria for what's allowed to be emitted into the air, outside the facility at the maximum concentration. It is one hurdle and one hurdle only. So, you're either above or below that number for all those compounds we list there, many of them do have air quality standards. If you are above those standards, you stop the process, you have to go back, the emissions are too high and they would have to be re-engineered. They would have to redesign a facility like this. It's only the first hurdle and what is up here is that for basically all of the numbers that we got out of the one-hour, 24-hours and the annual average, when you compare them to MOE guidelines, their concentrations were below those guideline values. This is good. That means that from the MOE's standpoint for the first hurdle you are below the guidelines. That is not where the process ends. As Jim said, after you get the EA done and all that works itself through, what you also need to do is get the Certificate of Approval to actually operate a facility like this. Although it is not written down anywhere in the EPA, the MOE is not going to give you a Certificate of Approval to run one of these facilities unless you then deposit the stuff out on the ground and look at the health

Human Health Risk Assessment (HHRA)

Residual Waste Study

- ◆ Problem Formulation
- ◆ Toxicity Assessment
- ◆ Exposure Assessment
- ◆ Risk Characterization
- ◆ Uncertainties / Limitations

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HHRA – Problem Formulation

Residual Waste Study

Exposure Pathways	Receptors			
	Durham – York Resident ¹	Durham – York Subsistence Farmer ²	Durham – York First Nations/ Metis ³	Durham – York Commercial Worker / Daycare ⁴
Direct Inhalation	✓	✓	✓	✓
Soil contact	✓	✓	✓	✓
Drinking water	✓	✓	✓	✓
Garden produce	✓	✓	✓	✓
Fish	✓	✓	✓	✓
Breast Milk	✓	✓	✓	✓
Wild game			✓	
Agriculture (meat, poultry)		✓		

1. Resident includes an adult, toddler, and nursing infant.
2. Subsistence Farmer includes an adult, toddler, and nursing infant.
3. First Nations and Metis includes an adult, toddler, and nursing infant.
4. Commercial includes an adult worker and a toddler at a daycare facility.

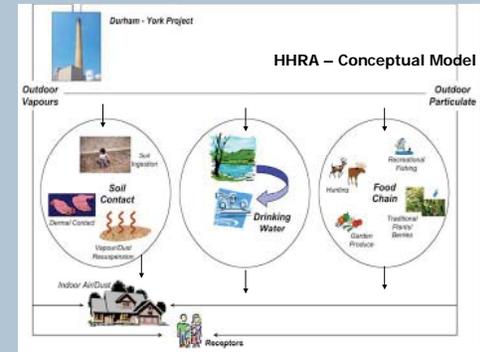
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HHRA – Problem Formulation

Residual Waste Study

- ◆ All Receptor Scenarios assumed to live at the maximum ground level concentration of air contaminants
 - this is very conservative as it is unlikely to be the case for all scenarios in the site specific assessment;
- ◆ Receptor life stages include:
 - Infants, toddlers, adults, composite receptor (from birth to 75 years)
- ◆ Evaluation of non-carcinogenic (threshold) and carcinogenic (non-threshold) chemicals;

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risks and potential impact to the environment. Although it is not written into the law, that is the process now for a facility like this and so this is where we go to step two. I will take you through the generic findings. So, the process now is what you would have to do in order to get license approval from the MOE to run a facility.

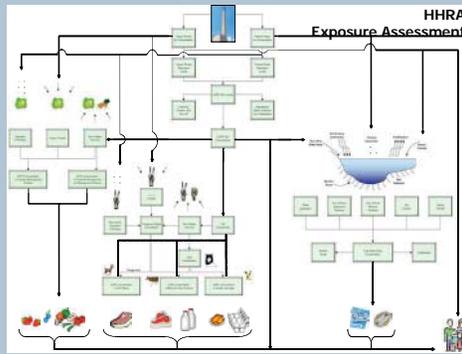
I need exposure point concentrations. What does that mean? That means when I have stuff coming out of the stack and the air modellers give us what the maximum concentration is at ground level outside the facility, that is an exposure point concentration and we know from the air modellers what the concentration is in the air. So, I can look at the health risks from that. What we then have to do is use a model that has been designed by the US EPA that has gone through a number of iterations that then models for us what happens when that stuff falls out onto the ground. It spends 35 years doing that and then moves into the food chain and all through the environment. That gives me the concentrations that people would then be exposed to. If you look at the type of things that we looked at there and got concentrations from the air modellers

again, then you could estimate what would be in the soil, what would be in the surface water, drinking water and backyard gardens. If you had a backyard garden and you lived 350 meters from this facility, what would get into your vegetables and then into the garden, fish, country foods and then breast milk? Then we would look at what would get into a mother after being exposed for this 35 year period and then the transfer of that. Any of the chemicals that would be in her body would be transferred to an infant 0 to 6 months old through breast milk. So, we actually model that as well.

I will take you through the Human Health Risk Assessment and the findings and how we got there. Really, in order for a risk to be present you need three things. The first thing is you need a hazard. You need a chemical that is going to be emitted into the environment. Well, we know we have that. We know that the blue circle is covered. We have chemicals that would be coming out of the facility. Secondly, you need a receptor. Receptors in this case are just people or bugs and bunnies and we know we have those. Then you need an exposure. We know that we certainly have that on the air side and the breathing

side. We know we have exposures to all of the things I showed you. We know we have all three of those. Even if you have all three of those, it does not mean that it poses an unacceptable risk to health or the environment. You need it to be exposed for a long enough period at a high enough concentration or through the right type of exposure to the toxic chemical. If you have those three things at sufficient concentrations and times, that is when you potentially have a risk.

Who are the people and what do we expose them to in this assessment? Again, generics. We don't have individual house locations, so we looked at four different scenarios. The first is a resident. So, that is if you had a residential home and mom, dad, Timmy and Jane lived in that home. 35 years of deposition of this stuff onto the ground, getting into the backyard produce. We look at things like toddlers eating soil. They are outside playing, getting their hands dirty, they stick their hands in their mouths and so they are eating soil. We look at the exposure to this stuff getting into the soil and into the toddlers from that. We look at drinking water and in this case, the drinking water scenario is very conservative. The drinking water



HHRA – Exposure Assessment

Residual Waste Study

- ◆ Estimation of total intake of CoPCs by receptors based on all identified exposure pathways:
 - CoPC concentrations in environmental media (air/soil/water/food);
 - Receptor contact time;
 - Receptor characteristics (ingestion/inhalation rate; food preference);
 - Chemical bioavailability;
- ◆ Estimated Daily Intakes (EDI) for non-cancer chemicals (mg/kg-d)
- ◆ Lifetime Average Daily Dose (LADD) for carcinogens (mg/kg-d)

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HHRA – Toxicity Assessment

Residual Waste Study

- ◆ Review of toxic potential for chemicals;
- ◆ Selection of toxicity reference values (TRVs);
 - US EPA Integrated Risk Information System (IRIS)
 - Health Canada
 - World Health Organization (WHO)
- ◆ Additivity of chemical considered for like acting compounds.

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was assumed to be in a 1 km² lake that was right on top of this maximum concentration. There are a lot of people living 350 meters away from the facility in this study, but the drinking water was impacted in this lake over a 35-year period. What was assumed was that people were drinking raw water out of that lake, which isn't something that occurs in this area, but it is a conservative way to do it. We looked at garden produce and backyard vegetables. We looked at fish because we have people who like to fish in this area. We looked at the fish living in this 1 km² lake 350 meters away from the facility and what the risk of eating this fish would be. We also looked at breast milk. Then we looked at two other groups. One is a commercial worker, daycare scenario. In Ontario, if your property is licensed as a commercial property, for the most part you are also allowed to have a commercial daycare. So, we don't just look at commercial workers, we also look at a toddler from 6 months to 5 years old going to daycare ten hours a day throughout the year. So, they are really just exposed to the air, the soil and we actually added the drinking water, which for that theoretical facility or daycare was coming from that lake. The closest one of these potential sites

to a First Nations reserve in this area of the world is 40 kilometers away. That being said, First Nations people tend to eat a lot more fish, deer and wild game. So what we did was see if you did have a First Nations community living 350 meters away from the site, would that pose a risk to that community because they are a sensitive subgroup from an exposure standpoint that we have to look at. The other one is what we call or refer to as a subsistence farmer. This is a farm family living on a farm that is eating everything from that farm more or less. All of their food intake is coming from the farm itself. These people are also exposed to deer, wild fowl and birds through hunting and they are also exposed to fishing. So, those are the people we looked at.

We again assumed that everybody lived right on this maximum concentration and the life stages we looked at included an infant and an infant is 0 to 6 months breast fed exclusively, not any other food introduced. That's the highest period of exposure to chemicals from breast milk for an infant life stage. Toddlers, six months to 5 years old, their sensitive life stage, adults 20 years plus and then also a composite receptor that would be living there

for a 75-year period. We also looked at some of the chemicals on that list again, that have the potential to cause cancer. They are the carcinogenic ones. We have some that may not cause cancer, but have other potential endpoints like liver disease or asthma inflammations. We look at both of those and they are treated a bit differently.

This is a pictorial of what I have been saying. You have emissions from the stack falling out as either vapours or particulate and people breathe those directly. They also get onto the soil, into the drinking water, into the food chain and are included when looking at the overall exposure to people. All that is, is the entire different math that is going to have to go in to get this exposure. This is a diagram which shows emissions from the facility and again we have concentrations in the lake, concentrations in the cow, the deer, the chicken, the eggs, produce in your gardens, tap water, fish and all that. There is a lot of math that is involved in this.

One of the reasons that it is very important to have a peer review done is that mistakes can be made. There are a lot of calculations, a lot of data points that we are playing with.



Non-Cancer Risk Estimate

Hazard Quotient (HQ) = $\frac{\text{estimated daily intake (EDI)}}{\text{tolerable daily intake (TDI)}}$

Acceptable Hazard Levels

If all pathways and background were considered than regulatory acceptable risk level HQ < 1

In Ontario if you don't consider background than regulatory acceptable risk level HQ < 0.2 – used in this study as acceptable level of risk

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HHRA – Risk Characterization

Incremental Lifetime Cancer Risk (ICR) =

$$\text{LADD (mg/kg/day)} \times \text{Cancer SF (mg/kg/day)}^{-1}$$

- Expressed as 3E-6 or three additional cases in an exposed population of one million
- Regulatory acceptable level of cancer risk
 - 1 additional cancer case in 1 000 000 people (10⁻⁶) Quebec / MOE (used in this study)
 - 1 additional cancer case in 100 000 people (10⁻⁵) Health Canada/all other Provinces

NOTE: over 1 in 3 Canadians will get cancer in their lifetime so risk assessment allows for 0.400001 instead of 0.40000 cases in a population

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HHRA – Uncertainty

- Overall, this study was very conservative in nature and included numerous additional uncertainty factors that err on the side of caution
 - Toxicity values have safe factors of 10 to 1000x built in
 - Receptor exposure at MPOI – overestimates risk;
 - Generic vs. site specific location data used in modeling (E.g. lake modelled to be 1 km² – overestimates fish tissue concentrations)
 - All receptor food sources originate in study area (e.g. Subsistence Farmer) – overestimates risk;

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We do our own internal quality assurance by checking those numbers six ways from Sunday. Intrinsic, that was their job, to make sure that the math that was done was done correctly. So, you do have to be careful, there is a lot of math. What we do is we have to estimate the exposure again and we do that on a daily basis. It's the way we look at exposures. How much of the chemical, what concentration would be getting into your body on a kilogram of body weight on a daily basis? So, that is how we look at exposures. We get all those things together, we put them in and that's the exposure side. For the hazard parts of the circles, I need the toxicity values. The way we get toxicity for all of those chemicals is we look at various agencies. The US EPA has a very exhaustive database and one of the best databases in the world of exposure of toxicity values for human receptors. So we looked at that, it's called the Integrated Risk Information System or IRIS. Health Canada also publishes a number of toxicity values and their review of toxicity of these chemicals. We used the Health Canada database and finally, organizations like the World Health Organization have spent a lot of time and a lot of money, especially over in Europe lately, looking at the potential health impacts from

things like those combustion gases that we are showing you and particulates and others. So, in some cases we look at WHO. How do you get a risk?

So, now I have exposure and I have toxicity. The way we figure out whether or not there is a risk for those things that don't cause cancer, but may cause other things like liver disease, etc., is you take your exposure, you divide it by the toxicity and if your exposure is less than your toxicity that's a good thing. That means from a regulatory standpoint there is no risk, or no unacceptable risk. In Ontario, we happen to be in a very risk intolerant province and jurisdiction. When I say that, what do they allow as a regulatory level of risk? Well, in some jurisdictions, if I was doing this, I would be allowed to say as long as your exposure was less than your toxicity, it would be okay. So, if you divide one by the other that will give you a value greater or less than 1. In some jurisdictions, I'm going to be allowed to use 1 as my acceptable benchmark. In Ontario, when we do this type of study, I am only allowed to have 20% of the actual toxicity threshold for these things. Not only that, the toxicity levels that we use are not based so that

you have just that much and then we start seeing effects. There are a lot of modifying factors and a lot of conservatives built into those values as well. At the end of the day, it is a very protective measure of looking at exposure for things that don't necessarily cause cancer. In terms of those things that cause cancer, how do we look at that risk? We basically take the exposure and the toxicity values that are provided that are simply called the cancer slope factor, so you would take one and multiply it by the other and what it gives us is the number of people in an exposed population that could potentially get cancer. For those of you that have taken a look at the report, you will see numbers like 3E-6. Well, what does that mean? That means that 3 people in a population of 1 million exposed would potentially get cancer from that exposure. You hear that there is no safe exposure to cancer causing agents. That is absolutely true. I have the math that I use to get it, you multiply one by the other and at the end of the day, I will be able to predict a potential risk from cancer causing agents. The difference there though is that the MOE, the Ontario Government has decided what their acceptable level of probable cancer is from these types of incidents. They only

Human Health Conclusions/Findings

Residual Waste Study

- Predicted concentrations of contaminant emissions to air (including background concentrations) met the MOE Schedule 3 and ambient air quality criteria published under O.Reg. 419;
- 400,000 tonnes/year EFW facility (emissions and multi-exposure pathway analysis) **did not** pose an unacceptable risk to commercial land use (workers/daycare) and residential land use scenario at the maximum point of impingement;

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HHRA Results 400,000 t/y

Chemical	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6	
	Concentration	Guideline										
...

Human Health Conclusions/Findings

Residual Waste Study

- Potential issue with dioxin exposure to breast fed infants under Subsistence Farmer and First Nations scenario at the MOE A-7 Guideline for all three EFW size facilities.
- Use of Peel facility current day emissions of dioxin did not pose a potential risk to breastfed Farm infants, but would continue to be of potential concern for First Nations if EFW Facility located within 300 m of a FN community
- Closest First Nation community to short listed sites is greater than 40 km

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Human Health Conclusions/Findings

Residual Waste Study

- Under all EFW facility scenarios emissions of mercury resulted in an unacceptable level of methyl mercury in fish ingestion for First Nation toddlers
- We did not have Ontario specific ingestion rates for local First Nations communities, default values of consumption are very conservative
 - Adults 220 grams fish per day, every day of the year
 - Toddlers 95 grams fish per day, every day of the year for 4.5 years.
- Closest First Nation community to short listed sites is greater than 40 km

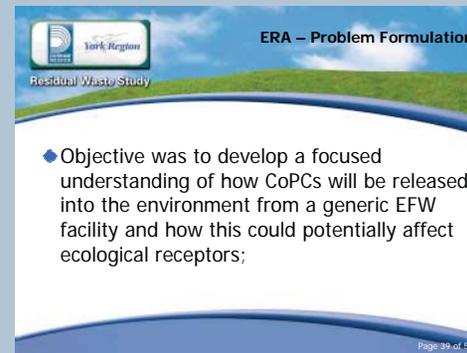
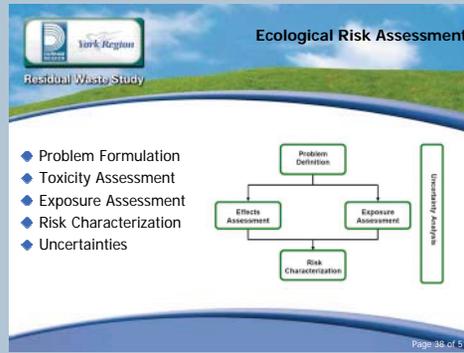
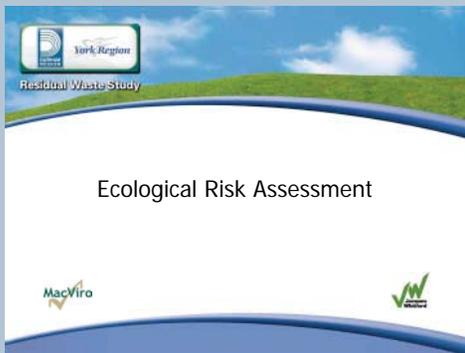
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allow us to look at 1 person in an exposed population of 1 million who are living at that 350 meter mark, and only 1 person out of that million people living right at that point. It's a very tightly packed group of people living 350 meters away, but only 1 would be allowed to get cancer from any one of the exposures that we are looking at. Again, you are in Ontario, it's a very risk intolerant province, 1 in a million in Ontario and Quebec. In every other province and federally it would be 1 in 100,000 people. There is uncertainty. Not only are there limitations in the studies that we do, there is also uncertainty. The comment that was provided by Intrinsic was that they thought that maybe we were too conservative on the side of caution. The reason they feel that is, a lot of safety factors are built into what we do. So again, the toxicity value isn't just if you got right up to that point and start seeing liver disease. They take that number and divide it by a number of safety factors, 10 times, a thousand times. It's the dose that doesn't cause that impact and they start putting in certainty factors. We had everybody again living at that 350-meter mark from the facility. That's unlikely to occur at any one of these proposed sites. We

would know where people are and we would actually predict the risk there. So, it may not be right on that maximum concentration. It's generics that we're using again in this 1 km² lake, with very little flow in and out and so the fish are living there for the 35 years. It's a very conservative way of doing things. If you were doing this on a site-specific basis, we would know where the water courses are. We would actually predict the concentrations in there. And the subsistence farmers eating all of their food, including their dairy and their chickens, off the farm. This is a very unusual circumstance now in Ontario. There are very few subsistence farmers left in Ontario now. There may be farmers in the room who live near this facility; I don't know, I haven't looked at the farm scenarios yet. I haven't looked at the farms that are there. Some of them may be crop farms and very little is actually grown on the farm. There are very few farms now that have every single one of those things. So, it's a very conservative way to look at it.

Overall, what do we find? Again, all of the air concentrations modelled met the Ministry of the Environment's minimum guideline for air standards. So, that was the first

thing. And then what we see is, we look at the risk of depositing things on the ground and having them transported throughout the environment. What we see there is that for two of the scenarios, the resident scenario and the commercial worker/toddler daycare scenario, we did not find an unacceptable regulatory risk to those two groups. That is where we came up with the conclusion that you could site one of these facilities in Durham and York, based on the fact that we found no unacceptable risk to residents or to commercial workers. What did we find? This diagram illustrates what we found. On the left-hand side, that is the long list of chemicals. Those are all of the chemicals that we looked at and across the top, these are the different groups of people. The residents are here, so are the infants and then our people living there for 75 years. This is the group of subsistence farmers, this is the First Nations reserve land and this is the commercial workers and toddlers. If the box is white, it means it was below the limit for all those chemicals and all the exposures summed up and added together. It was below the regulatory acceptable risk, either for cancer or non-cancer endpoints or effects. The boxes that are in red are the values that are above



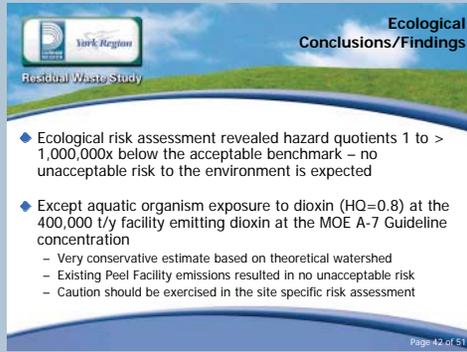
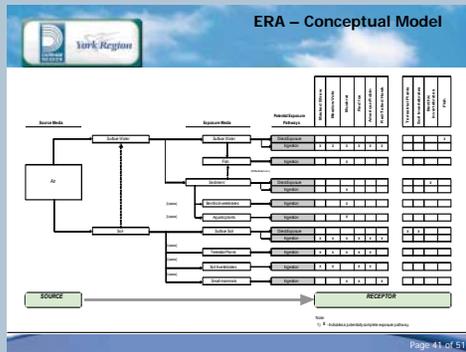
the acceptable benchmarks and this would cause some concern if they were actually to be there. What are those chemicals? Well, the first line of red is the dioxins and furans. Who is exposed and why is that box red? Those boxes are the infants who are being breast fed by their mom who has lived there after the 35 years of exposure has been deposited on the ground. Again, with certain things, we emit them at the Ontario limit as to what would be acceptable as a maximum value coming out of a stack like this. Dioxins and furans are chemicals that the Ministry has a guideline of what they will let you put out of the stack. What we are saying here is that if you actually had a subsistence farm scenario 350-meters away from the site, and/or you had a First Nations group there, I would not be overly happy about that from the modelling we have done and the potential risk to infants through breast milk. We know there are farms in the areas near the sites that they are looking at here, so what do we do? Well, on the next line here we have a white box, but this one is still red. What does that mean? What I asked the air modellers when that red box came up with the potential risk to the infants on the farm scenario was, I said to the air modellers that's the maximum

we're allowed to have coming out of a facility at that concentration. Model for me what's coming out of Brampton right now. What's coming out of Brampton right now for dioxins and furans is not the limit. It's about 10% of the limit. That is what they are achieving. 10% of the Ontario MOE's standard is what is coming out on any given day. When we model that, what we see is that by being at 10% of the limit, give or take, there is no longer a risk on a farm scenario to that breast fed infant for dioxins and furans. However, if you had a First Nations group there, there would potentially still be an unacceptable risk. So, what we conclude from that is, I wouldn't want to site one of these facilities next door or in close proximity to a First Nations reserve community where people are eating quite a bit of fish and potentially shooting a lot of deer and eating a lot off the land and more vegetables and fruit off the land. That is what we concluded from that.

This little red box down here is methyl mercury and that is a toddler that we said would be at risk from methyl mercury in a First Nations community eating a lot of fish during their exposure time if mercury was coming out at the guideline limit. Again,

mercury is one of the chemicals that has a guideline. We had not had time yet when we prepared the report to ask the modellers to look at the mercury in terms of what's coming out of Brampton, but that is something that we will be doing as we move forward here. But again, remember the closest First Nations community is over 40 kilometers away from any one of the proposed sites. I don't think that this would be the risk that we necessarily produce if you did it on a site-specific basis. But it is something you would have to be aware of. So, if Jim came up and said we have a new site and it's 1 kilometer away from a First Nations community, I'm going to start getting a little more concerned than I would be having residential scenarios or commercial/toddlers nearby. I'm not saying you couldn't, but we just want to look at it very carefully. So, that is the conclusions of the Human Health side.

The other side of that is once you get through that hurdle, we also want to know what the potential impact is on the ecosystem. Ecological risk assessment is very similar to human health risk assessment. The only difference is that we are looking at the foxes, the birds and the fish. We are not looking



ERA Results - 400,000 tonnes/year

Residual Waste Study

The table contains two columns of data. The left column lists receptors and chemicals, and the right column lists receptors and chemicals. The table is very dense with many rows and columns, providing detailed results for the ERA.



at the people, but they're exposed. There is toxicity for that exposure, one number divided by the other, good or bad regulatory acceptable risks, the same as with human health. The only difference here is that we don't give the foxes and birds cancer. We don't assume they live long enough for that to be the case. We are not worried about the wildlife getting cancer. So, when we look at this, the objective is the same. The difference here is that we are looking to protect the environment and we want to know what the impacts on the environment might be. That is just a list of the receptors that we looked at and there are a couple missing from that list. One of the things that the peer review did is it said, you have the small animals, the small furries, you have the fox and the hawks eating the small furries. You have the robins eating the worms. These are all good things. The peer reviewers actually said we want a bird that eats a lot of fish. We would like to see a mink because they eat a lot of fish and we already know that this fish issue can be something that comes up in one of these studies. They added one or two other things they'd like to see. So, we added them to the list, we modelled them, and we saw what happened. Again, this is just another

way to show you that there is a lot of math that goes into this study. Out comes the air emissions that get into the water and soil, we put it all the way up through these things. The ecological receptors are eating and are exposed to the chemicals and at the end of the day, you have the receptors across the top here and where there is an "x", it was just what was modelled. So what did we find? We found from an ecological perspective that for the most part, there would be no unacceptable risk to the environment. Most of the exposure would result in anywhere from 1, to in some cases a million times less risk than the acceptable benchmark. Now there was an exception to that. That was again our dioxins and furans. What happened for these chemicals? So, again, we have very big tables here, with the chemicals on the left. This is actually two tables, so the chemicals are on the left here. All of the same chemicals that we looked at from the human perspective are across the top and we have our shrews, our muskrats, our foxes, our soil invertebrates, which are earthworms and phytotoxicity, which is a fancy way to say potential impact on plants. At the end of the day, we see that there is still one red box. That one red box we came up with was

if you were to emit dioxins and furans out of the stack at the MOE's A-7 guidelines. If you had a lake that was 1 km² in size, 350 meters from that facility, there would be a potential that the concentrations that would get into that lake dioxin and furan wise, would be unacceptable for aquatic life, aquatic life being fish and all the other things that fish eat in the water. So, that's giving us some concern. We know that it might not be a good idea to have a 1 km² lake. You would have to be careful of the watershed. Again the air modellers gave us that number, remember what's actually coming out of the Brampton facility. We put that into the model and it's 10% of the guideline. Because they can just achieve that through the technology that they are using and the box becomes white. So, it went from being unacceptable to acceptable from the regulatory risk side. But certainly as you move forward, if you do move forward with the site and you move forward with the actual facility that you want to build, this is something that we are going to be watching pretty closely on a site-specific basis.

At the end of the day, I already told you what I thought the answer was, and that through the five Ps, proper design, operation,

Overall Study Limitations

- ◆ This study has a number of limitations and does not replace the need for a site specific risk assessment
 - Thermal treatment EFW Facility location – TBD;
 - Final technology and vendor – TBD;
 - Air modeling completed on a regional scale – not site specific;
 - Risk assessment completed on a regional scale – not site specific;
 - This report is meant as a feasibility study only with the purpose of identifying potential issues of concern for inclusion in a site-specific risk assessment.

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Study Conclusions/Findings

- ◆ Overall, it was concluded that a thermal treatment EFW facility could be sited in the Durham/York Region if the process invokes the 5 Ps:

proper design	D O M O R
proper operation	
proper maintenance	
proper oversight	
proper regulation	

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Conclusions/Findings

- ◆ Findings of this study will be used to:
 - Support siting criteria of the preferred site;
 - Identify potential concerns for technology vendors;
 - Support site specific risk assessment;
 - Assist in addressing some concerns raised by the public to date.

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Next Steps

- ◆ Future Recommendations include:
 - Detailed investigation of baseline environmental conditions at preferred site including;
 - Ambient air quality, soil, water, sediment, biota
 - Detailed Site specific Risk Assessment (SSRA) for selected site
 - SSRA conducted based on known vendor of technology and specific air emission factors expected from the facility

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maintenance, oversight and regulation, we think you could site a facility like this in Durham or York.

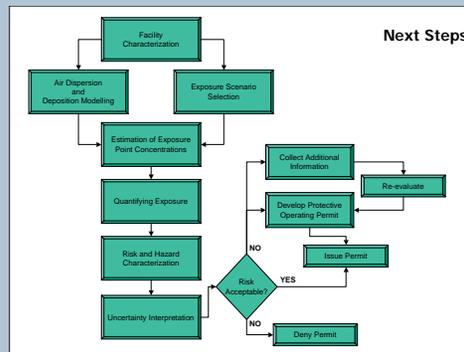
What is this study going to be used for? The first thing it's going to be used for is, it is going to help Jim and his team to start looking at the short-listed sites we have now and getting them down to one recommended site. They can start looking at the results of this study and say, okay is there a site on that list that we're going to have to take off because these findings show that it's not a good idea as it may be too close to something he knows of when he does all of the work there. It's going to help the vendors. It's going to help the RFP process, the bidding process because the vendors are going to get the study and the vendors are going to know first of all, regardless of the whole subsistence farm issue, the First Nations issue and the breast milk issue, that I'm saying it's not a residential issue. We, the Health Team and myself, have some concerns because of what we found here that if the dioxins and furans were to come out at the Ministry's guidelines, at that level that could be an issue even though it's not coming up as a concern. It's not red flagged in a lot of these scenarios.

The vendors can do better than the dioxin and furan emission limit and that is something we would look at. Even though it may not pose a risk, we know that we could get better than the limit in certain circumstances. It is the same thing with the mercury. It's going to support the site-specific risk assessment if you get that far in the process with the site and a vendor. As far as I'm concerned, it allows us to then come and start having discussions. The sessions held tonight and over the last week have been the starting point of the discussions. We did have recommendations in the Report and the first one is if you get to your site-specific scenario, you need to collect site-specific data. Jim was just saying actually today I think, that we got the approval to move forward to set up air monitoring stations in three areas that will capture the data we need from an air quality perspective. One will be located at the East Gwillimbury site and because of the location of the four Clarington sites, two are basically located together and they will collect air data. So, the air guys will be collecting a lot of air data over the next little while, that you will need when you get to this EPA level approval. We also said we would like you to go get soil, water, some vegetation and

perhaps some fish because there is not a lot known about that long list of chemicals that I showed you in this area and what the existing concentrations would be. The one thing that this study does not do is look at emissions from the facility and load them onto what people are going to be exposed to already. To some extent on the air side we did a limited review of that, but we weren't able to do that for things like soil and water and air to really get a level that we would be satisfied with. So, that's the type of work that's going to be ongoing and as Jim said, people will be driving around. We said that in no way, shape or form should this study be used as the final answer on health risk. You are going to have to do a site-specific ecological and human health study and satisfy yourself that the red flags that are raised here don't get raised. Because if they get raised in the future during the site-specific study, you can't build the facility. So, you have to make sure that they are not going to be raised or that something else doesn't get raised because of site-specific conditions.

This is the last slide. Not only did I let the peer review have a good crack at this document, it's an important first step. We

YOU CAN GET THE REPORT ON THE WEBSITE. I THINK THERE IS A CD OUT FRONT. YOU CAN GET IT IN A NUMBER OF DIFFERENT LOCATIONS FROM YOUR MUNICIPALITY OR THE REGION.



Public Input

Residual Waste Study

- ◆ We are opening a public review and comment period that ends July 31st
- ◆ Comments on the report should be provided to the Study Coordinator
- ◆ The intention is to have the final report prepared for September 2007 that takes into consideration all formal written submissions.

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are leaving this open until the 31st of July. Although my team believes it's a final report, there may be others that may want to see things improved. There may be other concerns or issues raised. So, we will leave this opened until the 31st of July. You can get the report on the website. I think there is a CD out front. You can get it in a number of different locations from your municipality or the Region. You folks are welcome to read the report. The report is about 100 pages and about 1,000 pages of technical appendices. Do I expect that everyone is going to read through this and want to comment on it? Probably not, but there will be others who do. Clarington, for example, has asked for an independent peer review. We will be meeting with the independent peer review team from Clarington, who has not been involved in the process so far. They will be doing a detailed review by July 31st. That will be made public. We will take into consideration all of the comments we get. Then we will look to finalize this report. If we need to make changes that the peer review team would like to see done differently or maybe they have other thoughts, we will incorporate that through an August timeframe. Hopefully in early September, we will be able to finalize

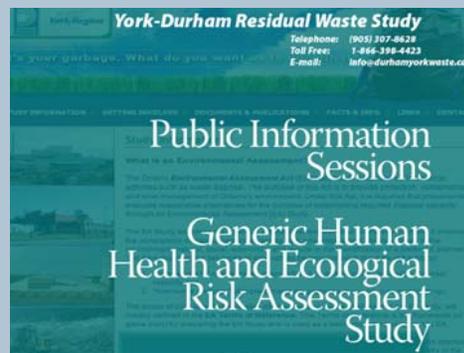
the document. We will also take into account all the public comments and there may be others. There may be university professors or others that actually do a technical review. All of the comments we receive will be taken into consideration, they will become part of the public record and you will be able to see what will happen.

Dr. Smith will now give us an overview on the Peer Review Team's thoughts.

DR. SMITH: I was one of the two Peer Reviewers. I am a Medical Doctor by training, with public health experience for over 30 years in the health and environment field. I have done many community health studies. I originally trained as a hematologist/ oncologist, blood diseases and cancer treatment, primarily leukemia way back when, before I started my career in public health. So, the perspective I bring to this is primarily the real health impact down on the ground. What does it mean for people? Those are the kinds of questions that I want to answer for you tonight. I work with qualified professional risk assessors and Elliot Sigal who is my co-reviewer, who was not able to be here tonight. He is Executive

Vice-President of Intrinsic Environmental Sciences, formerly Cantox. He is a qualified risk assessor with over 16 years experience. He has done hundreds of risk assessments, so he is eminently qualified. His role was to look at the technical competence of this report, to make sure that all of the appropriate assumptions were made, that all the correct formulas were used and when they were put into the model that they were all the right answers, at least for the inputs that were put in. My role was just to make sure that there were appropriate assumptions in the scenarios and so on that would reflect extremely conservative exposure conditions and that we would make the appropriate inferences. In both of our opinions, although there were quite a number of comments to improve the report, all of which were incorporated into this Report, that it was an appropriate risk assessment and the conclusions derived from it were appropriate. We must remember that all of the assumptions made here regarding the exposure, the emissions, modelling, all of the mathematical formulas and so on are basically more or less regulated. So, we are dealing with a highly regulated process when we are calculating or when the risk assessors are

A FACILITATOR IS AN INDIVIDUAL WHOSE JOB IT IS TO HELP MANAGE THE PROCESS OF INFORMATION EXCHANGE.



The Independent Public Facilitator

- My name is Ron Kervin and my role is to make sure the discussions are fair, transparent, balanced and informed
- **Fair** means everyone will be treated with respect, their opinions given a fair hearing.
- **Transparent** means summaries of these sessions will be published.
- **Balanced** means no one will be allowed to dominate or hog the discussion.
- **Informed** means the process will be based on "facts"

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2 Independent Public Facilitator



calculating risks. I think we should continue to remember that because it is extremely important that even though we do have some red boxes in the final results, these are important to note because they require a much finer look to see if this technology or any technology that is applied here is appropriate and does not present regulatory unacceptable risks. We could certainly discuss that in more detail.

FACILITATOR: Thank you. A lot of information has been thrown at us in a very short period of time. I would like to go over some ground rules with respect to how we are going to go through the question and answer period. As I said, my name is Ron Kervin. I'm with Olgilvie, Olgilvie & Company. I'm the Independent Public Facilitator. As shown on this slide, fair means everyone will be treated with respect. Their opinions will be given a fair hearing. Transparent means that summaries of these sessions are going to be published and Holly is here doing some online recording and we'll make sure that everything that is said here is captured. Summaries of what is being said are going to be sent out and will be available to you on the project website. Balanced means no one is going to

be allowed to dominate or hog the discussion. Informed means that the process will be based on as many facts as we have here this evening. We value your opinions. As I said, Holly is an Urban Planner with me this evening, who is doing the live-time recording. Durham Region also has a reporter of their own who is doing a recording, so they will be able to compare notes if we ever needed to and you will receive a copy of the summary. If you notice that we made any errors or omissions when you receive the summary reports, please feel free to let us know and we'll correct them.

So, what's an Independent Public Facilitator? A facilitator is an individual whose job it is to help manage the process of information exchange. The facilitator's role is to help with how the discussions proceed this evening. Public means a facilitator who acts on behalf of all of the parties involved here. An independent facilitator is objective and neutral and if at any point you feel I'm not performing my role in that area properly, please tell me and I will immediately try to remedy that situation. The purpose of tonight is to present the Consultants' findings on the Generic Health

and Ecological Risk Assessment Study and to answer all of your questions and potential concerns. We will now entertain formal questions from the floor and I would like to ask that if you have a question, please proceed to one of the microphones and ask the question, so then it will become part of the real-time record that Holly's doing. If you're not comfortable coming up to the floor to ask questions and many people aren't, you can write your question out, put your hand up, I'll gather them up and we'll get as many of those questions read intermittently, alternating between questions from the floor, so they get into the record. Any questions that we don't have time to answer, either the written ones or the ones from people in line, we'll ask the people that didn't get answers to their questions at the microphones to write those down too and we'll ensure that Durham Region provides the answers for that record. Around 9:30 p.m., we'll break and have the experts available to answer questions at the display panels. If I could have your permission to establish some ground rules for this evening. As I said, you have the right to ask any question and you deserve a straightforward answer. It doesn't mean you'll like the answer, but you deserve

DURHAM-YORK RESIDUAL
WASTE STUDY
GENERIC HUMAN HEALTH
AND ECOLOGICAL RISK
ASSESSMENT STUDY
WEDNESDAY JUNE 27TH, 2007
FAITH UNITED CHURCH,
COURTICE

We value your opinions

- Holly Huhen is an urban planner with me who will keyboard a "live-time" summary of the discussions
- You will receive a copy of the summary
- If we made any errors or omissions, tell us and we will correct them



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3

Independent Public Facilitator

What is the Independent Public Facilitator?

- A Facilitator = A facilitator is an individual who's job is to help to manage a process of information exchange... the facilitator's role is to help with HOW the discussion is proceeding.
- Public = a facilitator who acts on behalf of all of the parties involved
- Independent = a facilitator who is objective and neutral
- If at any point you feel I am not performing my role properly, tell me and I will immediately correct the situation



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4

Independent Public Facilitator

DURING THE SITING
PROCESS, WE IDENTIFIED
REGIONALLY OWNED
PROPERTIES, MUNICIPAL
PROPERTIES, ANY SORT
OF PUBLICLY OWNED
PROPERTIES.

an answer. When enough is enough I would like your permission to allow a question and answer, a follow-up answer, and then I will move on to the next question just to keep it rolling. When a question is asked, give the other person time to answer the question and please don't interrupt. Wait until they're finished for your follow-up if you should have one. Accept the concerns and the goals of others as legitimate. This doesn't mean you have to agree with each other, simply respect each other's rights to be here and hold different opinions. To ensure that everyone who wants to speak has an opportunity, please keep your questions and comments to about a four-minute limit. And I'll be kind and gentle, but somewhat brutal if necessary, in order to allow people to move on to the next question. I hope you'll be happy with that approach in order to get as many questions as possible on the floor, into the record and potentially answered this evening. There were some questions after the last public presentation. Apparently, several people asked us if we would provide question cards as an alternative to speaking at the microphones. So, we have provided question cards for people who don't want to go to the microphones. Simply fill the card out and

give it to me and I'll see that we either ask the question if we have time, or we will make sure it's part of the public record. We have two sorts of paper assistants tonight. One is again the question record, if you didn't get a chance to say something or ask a question, you put your name and address on it, mailing address or email if you have it, and that's at the back of your guide. And then there's a Facilitator's Feedback Form that we would like you to use, just to provide us with some feedback on how we did as a facilitating company and so that we can make changes if you suggest them, just like the changes that were made to provide the question sheets. So, with that very brief introduction, let's begin the Q & A.

Q: Why does Durham Region, which has a smaller population, seem to have most of the host sites? Is this because of Darlington Nuclear Station and Lake Ontario proximity?

A: The reason that Clarington has most of the sites is actually a matter of the way we went through the siting process. It just happened that way. During the siting process, we identified regionally owned properties, municipal properties, any sort of

publicly owned properties. We also identified private sellers, people who owned properties that wanted to offer up sites. Going through that whole process, we did get a fair range of properties in different areas of the Regions. There were some that came in from Pickering, Whitby, Vaughan, a fair range geographically distributed throughout both Regions. When we went through our screening process, what we found was that the properties that were first large enough and in industrial areas that are largely undeveloped, those types of properties only exist in the urban fringes of Durham and York, which includes Clarington and East Gwillimbury. You go into Whitby, Ajax, even into Oshawa and York Region, Markham and Vaughan, there simply aren't parcels of land that are 25 or 30 acres left that are industrial or commercial areas. They have all either been developed or subdivided into numerous small parcels. It wasn't as if we went out and looked at Clarington and said these are the sites. It just happened to flow out that way that most of the short-listed sites are actually in Clarington.

Q: I am a resident of Durham and also a recently retired health care practitioner. One of the concerns that I have obviously, with

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Purpose of Tonight

- To present the Consultant's findings of the Generic Human Health and Ecological Risk Assessment Study
- To answer all your questions and potential concerns



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WE ALSO IDENTIFIED PRIVATE SELLERS, PEOPLE WHO OWNED PROPERTIES THAT WANTED TO OFFER UP SITES. GOING THROUGH THAT WHOLE PROCESS, WE DID GET A FAIR RANGE OF PROPERTIES IN DIFFERENT AREAS OF THE REGIONS.

that background, would be the most sensitive receptor, the growing fetus in utero. There is no acceptable level of dioxin in that time of life, as all health practitioners understand. My concern also is the neonate from age 0 to 6 months on an exclusive breast milk diet, which is of course what I would hope that they would be on. There again in your current study, you mentioned that there was a 60% reduction in maternal dioxin levels in that 6-month time frame. You didn't mention where those dioxin levels go and obviously, they go to the developing neonate. I find that an unacceptable risk and we need to understand that each one of us in this room has dioxin levels currently in our body. Our children have higher dioxin levels usually and other contaminants. A colleague that is known to Dr. Lesbia Smith and myself, Dr. Dorothy Golden Rosenberg speaks of the body burden in Ontario children due to contaminants and there are certainly more exclusive lists. I guess as a health care professional, I have been saying in this room since April that I have many, many concerns. The risk assessment that you have provided is very general. I can appreciate that you feel that it is complete and certainly conservative in nature. I do not agree with you. I think

there are some real concerns. Dr. David Pengalli, who reviewed your authorship of the Halton Report, you have authored this one as well, had some real concerns in his 22-page peer review, which I have. I can't go into each page, it wouldn't be fair to the audience, but it is on my website and I invite you to read it. Dr. David Pengalli is a medical researcher who has worked for a number of years in Ontario modelling air dispersion models and contaminants, getting a greater understanding of human contaminants from air in this province. He has worked at McMaster, at the University of Toronto and has won many environmental awards concerning the knowledge that he has brought to human health and air pollution. He feels that the incinerator unit in Halton Region exposed Halton and indeed our complete air shed to an unreasonable risk. On June 20th, that Council completely, all of them, voted against this proposal in their Region. The same day in Durham in our Regional Council, where I was present, seven out of the 28 voted against this proposal and now we are going forward. I'm not sure this is the route that we should be on. When I practiced in the UK certainly, dioxin was a concern in France. Dioxin is still a concern

and they are doing huge studies looking at abatement of dioxins in their food sources in that country, where again they have exceeded the WHO's guidelines for between 1 ideally and up to 4 picograms of dioxins daily. France is well above that in some of their food stuffs and is the country in Europe, which incinerates the majority of their waste. In the UK where I practiced, only 10% of their waste was incinerated and certainly, the incinerators, I agree, have improved since the 1970s and 1980s. We have closed down over 85 incinerators in the UK because of their completely inappropriate emissions to air and water and indeed the food stuffs that were of concern for the general population's health. I have lived in countries where this has been an established way of life, where 75% of their waste is indeed landfilled and that will have to stop, they landfill everything. With the new guidelines in Europe, stabilized landfills will need to become the established norm instead of putting all of their organics and everything into a landfill, which of course we know from health studies that have been done, expose the population to cancer risks as well, in terms of proximity to landfills. So, my concern is that I think people need to know that there are risks, that risk assessment is

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Tonight's Agenda

7:00-8:00 - Presentation



8:00-9:00 - Q&A session



9:00-9:30 - Answering Questions
at Display Panels



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Can I have your permission to use these Ground Rules?

- You have the right to ask any question and you deserve a straight forward answer... doesn't mean you will like the answer, but you deserve an answer...
- When enough is enough - I would like your permission to allow question-answer-follow-up-answer and then I will move on
- When a question is asked, give the other person time to answer the question... please don't interrupt, wait until they are finished
- Accept the concerns and goals of others as legitimate. This does not mean you have to agree with each other, simply respect each other's right to be here and to hold different opinions.
- To ensure that everyone who wants to speak has an opportunity, please keep your questions /comments to a 4 minute limit.

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SO, IT'S UP TO THE
COUNCILLORS, IT'S UP TO
THE REGIONS AND IT'S UP TO
FOLKS LIKE YOU TO MAKE THAT
DECISION AS TO WHETHER
OR NOT YOU WANT TO MOVE
FORWARD. WE ARE THERE
PROVIDING THE SCIENCE AND
THE LEVELS THAT ARE THERE.

an imperfect science. If the levels of health protection that we have in Ontario indeed worked, we would not see the huge cancer increases in our population that we see currently. Thank you.

A: To respond to a couple of these points, there is no question I am the prime author of a small health literature review that was done for Halton. That literature review was not anything related to this type of study or this level of detail. That literature review identified a couple of things. The first one was that there are health concerns for people living near a facility like this that have been documented in the past. We identified those and you have to understand what those health concerns are or you can't do the risk assessment. The second thing that study did was identify the type of chemicals you would want to assess. Halton has not built a facility; they're in a process of deciding whether they'll even start an EA. It was a business case document that was produced. They are nowhere near where Durham or York are. We identified what the chemicals are that you would be concerned about and then there are two or three pages in that document, which I feel are the critical pages. I think I am on

the same page as David Pengalli and that is that if you are going to try to build a facility like this, if Halton wanted to do that, then they would have to a) collect all of the background information that we proposed in a way that we are doing here and b) you would have to do a site-specific risk assessment. So in no shape or form was any modelling done in that report and at the end of the day, I couldn't tell people whether or not they had a variety of scenarios they wanted to look at. I couldn't tell them whether it would be acceptable or not. That wasn't the purpose of the study. On the infants, I don't think there was any attempt to not indicate that yes, when you have mothers breastfeeding infants there are certain organic chemicals, things like the dioxins and furans that will leave the breast milk and the body load that a young mother has accumulated over the years of things like dioxins or PCBs that we are exposed to, would then go into the infant. That is the risk that we are actually looking at here. That is the risk that we are documenting. So, there is no attempt to say that 60% went anywhere else other than to the infant. The final thing I guess I would say on that is, I appreciate that you may not be comfortable with the regulatory accepted level of risk and that is a personal decision,

I understand that. The role of the risk assessment team is not to make the societal judgments. It is to present the information. So, it's up to the Councillors, it's up to the Regions and it's up to folks like you to make that decision as to whether or not you want to move forward. We are there providing the science and the levels that are there.

A: There was no specific question obviously, and you had implicitly many, many questions. So I think it's not possible for us to answer all of them, or even to enter into a debate about any specific differences that we may have. I certainly agree with some of the things you said and obviously, I am in this field. My perspective both politically and in practice, is to be as health protective as possible when I do studies on communities and so on and when I teach it at the University to my students. Having said that, I think there are a couple of things that need some clarification. And that is, there have been tremendous improvements. In fact, some cancer rates are indeed going down. Some because of public health interventions that have taken place. There have been tremendous improvements in cancer mortality giving us a far greater opportunity to have cancer survivors. So, the

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New Question Cards

- After the last Public Information Sessions, several people asked us if we would provide "Question Cards" as an alternative to speaking at the microphones
- So we have provided Question Cards for people who don't want to go to the microphones
- Simply fill-out the card and give it to me and I will read the questions for everyone to hear and then ask the consultants to respond.

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HOPEFULLY THIS PROCESS
CAN HELP US LOOK AT
THAT BETTER AS WE GO
THROUGH THE ITERATIONS.

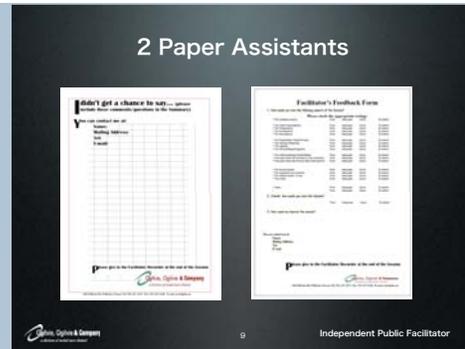
prevalence has gone up and we should not confuse prevalence because people survive longer. Prevalence is a function of both incidents and survival. So, if the prevalence goes up, we don't necessarily have more incident cases, but certainly better survival. I think there are a whole lot of questions that we can discuss perhaps, but I don't think people should go away thinking that there is a huge cancer epidemic. There is not an epidemic and I think that has been both argued and supported by evidence presented in many academic papers. I am not saying that things are great, but I also think that there is reason for hope and there is reason for us to come to some sensible decisions, to come to these important decisions about things that affect us all and not necessarily to use false information to do that. There have also been tremendous improvements in life expectancy. I can expect to live 20 years after my bilateral knee replacement now. I can live to 84 as a woman in Canada. So there are a lot of things that offer us good hope and I think that we should focus on those and focus on making good decisions not on alarmist decisions. Hopefully this process can help us look at that better as we go through the iterations.

Q: I am here as a concerned citizen. I have no commercial interests in this process or in waste management. My background is electrical engineering, material handling technology. I have listened to Dr. Chris Ollson's presentation and I have one very brief remark and a question. My remark is about that spreadsheet you showed on the screen. You mentioned in the sentence before that about the thermal technology including plasma arc technology and after that you came back to that spreadsheet and I personally know there is something not right in there. The difference between thermal technology, which is incinerating and plasma arc technology is very clear. One difference is that we have no fly ash in the plasma technology and the second difference is what the speaker before really expressed concern about, in the plasma technology you have zero dioxins. That is a very important issue and you should separate that. It is ridiculous you telling the people as a doctor here that thermal technology has something to do with plasma. It's not the case. That is my remark and my question. For example, you have a ten tonne truck with average municipal waste. We have in this truck a few batteries, a few light bulbs, a little bit of pressure treated

wood. Let's say 100 grams of mercury and that truck is going into that facility you showed here. I would like to know how much mercury is going into the environment out of the chimney. I want to know how much fly ash is going into the landfill after the incineration. I want to know how much CO2 is going into the environment. Nobody speaks about CO2 here. It's a very important issue and just to emphasize again, the dioxin part that is something, which I would like to ask you to reconsider and go into a little bit in your next presentation.

A: I will address the statement first. I apologize if somehow during my presentation I was saying that plasma arc or plasma anything would create the dioxin issue. That is not what I meant to say, if I did say that. What I was trying to explain was what we did look at from here was a thermal treatment mass burn incinerator. We did not look at the other types of technologies. I was never trying to purport that somehow this covers that. There are different technologies out there, they have different emissions, different vendors and so that was not the intention there. On to the questions, for mercury, those numbers are available and they are in

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THE ONE THING WE DO KNOW IS
THAT IN TERMS OF AIR EMISSIONS
AND THE EMISSION OF THE
CHEMICALS INTO THE AIR, A MASS
BURN FACILITY IS LIKELY TO
HAVE MORE AIR EMISSIONS THAN
THE OTHER TECHNOLOGIES THAT
YOU WOULD POTENTIALLY BE
LOOKING AT.

the report and some of the other reports that have been done for the EA Study. So, we can tell you the emissions that are coming out from the stack, for example, either at the guideline, or if you look at something like the Brampton facility, it's about 2- or 3-fold less than the guidelines. We have those numbers in the report. In terms of the what's going into the ash, that's left over. I don't have the specific number for that, but I'm sure those numbers are available for things like the Brampton facility and others, that is accounted for. The mercury cycling is something that is very carefully taken into consideration in any type of facility emission, so it's not just this type of technology. The mercury information is well documented. In terms of the batteries going into the trucks, I think there are waste diversion issues around that in trying to get the mercury out of the waste stream. I think it is a very big focus, at least from what I'm hearing. At the end of the day, if they don't get the mercury out of the waste, it still has to be below the guideline limit and like I said, at least in Brampton we are looking at 2 to 3 times less, I believe, of mercury. So, mercury is certainly a concern from any type of facility like this and is something that has to be well documented.

We have to make sure that we understand the cycling of mercury. CO2 is something that is not covered in this health report; it is covered in other reports that have been done so far as part of the EA Study. There are things like the greenhouse gas emissions as well as some of the issues around smog that were not part of this project. They have been covered in some of the other EA reports. That is something that is going to have to be very carefully examined on a site-specific basis.

A: Let's not forget that water vapour is also a greenhouse gas. So CO2, water vapour and others.

Q: The acceptable risk of 1 death per million people, is this per year or 1 for the 35 years the plant is in use in your figures?

A: The first thing to clarify is that it's actually not 1 death; it's 1 incidence rate. So as Lesbia was saying, it's not that we are saying that a person would die from that cancer, that 1 in a million. It's that potential to get that form of cancer that we are looking at. So that is the first thing and it is based on the life of the facility, so it is not 1 per year. It is all of the emissions from that facility in an exposed

group of people living for 75 years. It would be 1 incidence rate over the entire life of the facility and that age group.

Q: I am a concerned citizen. I know the other sessions you have had in the past. I've been to a couple of them earlier in the process. I know it has been brought up a few times, plasma and other technologies, whether it is being looked at or considered and I got the impression that it was always a possibility that no technology was being overlooked. You said in this assessment it wasn't looked at. Was there a reason for that? I just keep getting the idea that the Region is very pro incineration.

A: The reality is that we don't have the vendor or the technology, they came to me and said how can we start looking at health risks and what should we do. The one thing we do know is that in terms of air emissions and the emission of the chemicals into the air, a mass burn facility is likely to have more air emissions than the other technologies that you would potentially be looking at. We are not able to model all of the technologies, I would be wasting your taxpayer money modelling all the different types of

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WE WILL BE ASKING
THEM TO GIVE US
DOCUMENTED TEST DATA
OF THE PERFORMANCE
OF THEIR TECHNOLOGY.

technologies out there, all the different scenarios we could do. It wouldn't be a good use of your money. Instead, we said let's look at a reasonable worst-case scenario. So, when you get to the site-specific stage, I will have zero input in terms of which technology should be selected. That is not my role. I will look at the potential health risks from whatever is being put on the table. It is not that we were trying to exclude other technologies and please don't take from what's in the Study that somehow the Region or the EA Team said this is what we are going to build so we want to know the risks from that.

A: Thermal treatment is defined in Ontario regulations. It includes combustion, gasification, pyrolysis and plasma gasification. The risk assessment looked at the emissions from a black box that met certain requirements and the way the regulations are defined, that could be plasma. Now, we have heard from plasma vendors that their emissions are a whole lot less than combustion and so in the upcoming procurement process that Durham will be going through, there will be a request for qualifications from vendors of different technologies. We will be asking them to give

us documented test data of the performance of their technology. Vendors of plasma gasification will be more than welcome to provide us with that information. Just so that we are clear, the methodology that Chris used in the health risk assessment wasn't technology specific. It was based more, as he said, on the regulatory limits and the regulatory guidelines apply to all thermal treatment, which could be combustion, gasification, pyrolysis or plasma gasification.

Q: I live north of Orono. I have two questions for Mr. McKay. Would it be possible for you to put up your slides with your presentation where you listed the order, the next steps in the process, site selections since September, EA submission in December? It's just so everyone could see what I was looking at, what's causing my question. What I believe I saw was that site selection would take place in September and that you were planning to submit the EA for approval in December. I believe that I also saw that vendor selection and technology selection would take place in mid 2008. There you say submission in late 2008. Did it say 2007? Okay. So, EA submission will take place in late 2008 after selection of the technology, so that is confirmed.

A: No, that is incorrect. What that should say, there is always one mistake in these presentations, what that should say is that we plan on submitting the EA in late 2007, so probably December 2007 or January of 2008.

Q: I knew I had a reason for my question, there it is. So, my question is how can you submit the EA prior to vendor and technology selection and more specifically, since the Generic Human Health and Ecological Risk Assessment says that the risks cannot be evaluated until the site and the technology are selected, so that is part (a). If you are going to do this site-specific risk assessment for the technology after EA submission, my question would be why and through what process and how will the public get to comment?

A: That was three questions. To give you an idea of the process, we have been talking for about two years now on this EA process, the Environmental Assessment Act Approval's process. That is the first hurdle in getting a facility like this up and running. You have to get EA Act approval and then there is a whole suite of other approvals that may be required. The one that is required for sure is the EPA, which essentially takes the site you have

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DURHAM AND YORK
HAVE BOTH COMMITTED
TO A HIGH LEVEL,
IN MY MIND, OF
CONSULTATION.

through your EA process. You identify what the technology is and where the site is and with a fairly high level of detail, you confirm the suitability of the site and the technology. Your EPA approvals process then takes it to a whole other level of detail and confirms in a very specific manner the suitability of that site and to tie into what Chris will be doing, based on the site-specific risk assessment, confirm the ability to site that facility and not have an unacceptable regulatory risk. What is going to happen is, we are going to submit our EA in late 2007. As is typically done through these types of processes, through our EA process we will have enough information gathered and collected that we will be confident at the EA level that thermal treatment on a particular site is the best alternative for the Regions of Durham and York. Then we get into the full EPA application process. We can start that background work and the detail of the EPA process while the Minister is reviewing the EA document. We need to sit down with the MOE and really discuss the timelines, because once we submit these documents there is a very intensive level of commitment on their part to start reviewing all of these documents and dedicating resources to reviewing them. What we expect is that we won't receive EA

approval until we have all of the site-specific work done and all of the EPA approvals work done. When we get our EA approval, we will also be getting our EPA approval. So, we will submit the EA so that the Minister can start reviewing the documents. The public and agencies can start reviewing the EA documents, but we won't actually get approval on that until we get all of the site-specific work done. We will then be able to confirm the results of the EA.

A: To get that EPA approval, it is posted up on the MOE's website. It's a review period for public comment and everything else. The other thing I can tell you about how the public will get input into the risk assessment and the site-specific assessment. I have been assured that regardless of what the timing is for this, we won't be completing a risk assessment and site-specific study and filing the next day for EPA approval. This is something that would have to be reviewed and taken back to the public. The public has to be assured. I'm not going to come here and tell you that we have some concerns and then not be able to come back on a site-specific basis to explain whether those concerns have been met. It will be done whether it's formally part of the

EA or the EPA, one thing is the formal law, what you must do. Durham and York have both committed to a high level, in my mind, of consultation. They are not going to be submitting the risk assessment without you folks getting to see it first.

Q: I know this is not the place for a debate, so I am not going to debate your comments, but I just want to clarify to make sure that I have understood it correctly. You will submit the EA prior to vendor selection technology. You may not get approval. What I am concerned about is the public comment period that is specifically tied in that occurs around the time of submission. My concern is that the public may not get to comment through the EA process on the health impacts arising from the specific technology. What you are telling me is that approval may not be provided immediately, or it might be provided after you submit the studies. My concern is how do we, the public, comment on those studies as part of the EA process given what you are contemplating? I just want to make sure that I understood you correctly and that my concern remains valid, because it's the timing.

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THE RFQ AND THE RFP
PROCESS ARE STARTING
TO BE CONFIRMED
NOW, ALONG WITH THE
TIMELINES FOR THAT.

A: I think to address that comment what we will do is when we come back out in September with our next round of consultations, by then we will have had a chance to speak directly with the Ministry about this. We will establish what the specific timelines will be for the next year and will be quite open with the public that this is what is going to come out. This is the timing for your review on it and this is how the different things will be issued, whether it's part of the EA Act, whether it's the EPA, where your opportunities are to comment in a forum like this versus where your opportunities are to send specific comments to the MOE with your concerns addressed. So, what we need to come out with is the next set now that we have a pretty good idea of when we will have a preferred site. The RFQ and the RFP process are starting to be confirmed now, along with the timelines for that. We will come to the public with a very specific set of timelines that will outline exactly when you can provide comments and who you can provide comments to and what the sequencing is in issuing all of these different documents.

Q: I am from Port Perry. I think you said that you did not carry out a similar generic study for Halton.

A: Yes, that is correct. The Halton study was only a paper-based review of potential things that I would be concerned about.

Q: Could you please give your opinion on what country has the most stringent standards for evaluating emissions from an EFW facility?

A: I think there is a two-part answer there. I will look to these guys on my left on the specific standards of air quality, but what I can tell you is that the way in which we do these studies, the way in which we evaluate health and ecological risk is on par with and in accordance with not only Health Canada, but EPA, US EPA, European Risk Assessment and WHO. The process of risk assessment is a very universal process. It is the level of risk in terms of what is acceptable and there is not another jurisdiction in the world that has a more stringent standard for the risk outcome than Ontario. WHO, US EPA, Europe, nobody has a more stringent risk based outcome than Ontario. Maybe for the air standards I think they vary, but I will leave that.

A: The air standards in Ontario, the European Unions' incineration directive and the US EPA

standards are all quite similar with respect to contaminants. One thing I should point out is that the Ontario regulatory regime, the A-7 Guidelines, is a guideline and it's not a standard. Therefore, it forms the basis for the regulations. Specifically, there is no regulation statement in A-7 about continuous emission monitoring. Yet, in the Peel facility the law for the facility is the site-specific Certificate of Approval for that specific facility. So, the guideline in A-7 is a starting point. In reality the terms and conditions, there are many more terms and conditions and a lot of that comes from public input from concerned citizens about what they are concerned about and the facility. That gets put right into the Certificate of Approval for the facility. So, A-7 is a starting point, but there are a lot more conditions associated with the Peel facility or would be for a facility here than is listed in the A-7 Guidelines. But the A-7 limits are comparable to the EU and to the US EPA.

Q: Has there ever been an actual detailed site-specific human health and ecological risk assessment and air dispersion study of the Peel facility, an actual one?

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THE HUMAN HEALTH RISK
ASSESSMENT CONCLUDED
THAT THERE WOULD BE NO
UNACCEPTABLE REGULATORY
RISKS AND THAT THEY WERE
GRANTED APPROVAL TO
CONTINUE TO OPERATE THAT
FACILITY, PARTIALLY BASED ON
THAT WORK.

A: Yes, the Peel facility is where Cantox did a human health risk assessment in 2000 in order for them to get continued approval to operate that facility. So, it was a human health risk assessment only. There was not an ecological risk assessment done for that facility. The human health risk assessment concluded that there would be no unacceptable regulatory risks and that they were granted approval to continue to operate that facility, partially based on that work.

Q: I'm from Bowmanville. I am wondering if there has been an environmental study done about all of this? We have hundreds of thousands of tonnes of garbage being shipped down to Michigan in diesel garbage trucks. In four years that's going to be millions of trucks going back and forth, taking the garbage down and driving back empty. I wonder if there has been an assessment done on all of these diesel fumes between here and Michigan and how that is going to affect everybody else with acid rain, etc.?

A: We did a lifecycle analysis of remote landfill versus a local energy from waste facility and looked at the emissions from

the facility, from transportation and from the reduction in emissions from the energy that is coming from the EFW facility. It means you don't have to put as much out from other power sources and the energy benefits from recycling the materials that are recovered from an EFW facility and when you look at those overall effects, the EFW facility has lower emissions of greenhouse gases compared to the remote landfill. It is lower in total emissions of smog precursors. It has fewer emissions of the pollutants that cause smog than the remote landfill and it has lower emissions of acid gases, which contribute to acid rain.

Q: We are ruining the roads between here and there with all those trucks going down. That's not even included in any of these studies.

A: We didn't look at that.

Q: Has consideration been taken for the already overburdening 401 traffic? This will no doubt increase considerably. Why hasn't the new 407 area been taken into consideration? Clarington already has more than its share of nuclear plants, with the nuclear plants, hydro, major concrete plant,

Goodyear, etc., all of which are already burdening our environment.

A: We estimated the number of trucks coming and going from this facility, it's less than 60 trucks per day as we have said before. There is currently an ongoing traffic study to determine the traffic impact of these trucks at each of the sites. That is one of the factors that goes into the comparison of the sites and the ultimate selection of the preferred site.

A: In terms of what wasn't said, but what would be done on a site-specific basis, is the cumulative loading of all the sources in whichever area you would be looking at. You can't do that on a generic basis because you don't know what those other sources would be. That's why we are going to collect background air data and that's why any of the other sources in the air shed are going to be looked at as well. This is being put on top of that loading.

Q: Are we going to be taking Toronto's garbage as well?

A: No.

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COURTICE



I WANT TO TELL YOU THAT THE
REGION OF DURHAM DOES NOT
SUPPORT OR PROMOTE ANY
SPECIFIC TECHNOLOGY IN THIS
CLASS OF TECHNOLOGY.

Q: I am from Northumberland County and have practically been at all of these meetings. My first question is as I have said before, why are you looking at yesterday's operation, incineration when as I have heard mentioned a few times this evening, plasma gasification is much superior to incineration. Now rather an interesting aspect, at one of the meetings right in this hall Mr. Merriman was kind of concerned because I asked some very embarrassing questions. He came down, sat beside me and asked where there are plasma gasification operations. Now he took an address of it and whether he has made use of it, I don't know, but in any case let's look at that. I know it's going to take more time because you have spent a lot of time so far looking at incineration and I have been to 15 different incinerators in Canada and the US. I know that there are two in Ontario that have been closed. I have been at one in New York State. So why should we be looking at those things? And just for a quick rundown on plasma gasification, I briefly gave this the other night at the Council meeting at Clarington. There is no chimney; there are no emissions from it. The temperature does not burn at all, it is not burning, it is melting, because the temperature at the

plasma unit is something like 24,000 degrees F. Therefore, it will not burn, it melts and there are no furans or the other problems with that because there are no emissions. Now, when the CO₂ comes out of that, it is run through the gas turbine to generate electricity to operate the plasma and also puts a considerable amount back onto the grid. So, it is a very worthwhile method. But in any case, we won't go any further with it. But I looked at this one paper that was on one of the documents on April 18th, 2006. On the front it says, "Evaluation of 'Alternatives To' an Identification of the Preferred Residual Processing System". I have heard very little about the plasma method. Right now, we have been told by an MP a few weeks ago at a meeting in Cobourg that there are 57 incinerators being closed down in Germany and being replaced with plasma gasification. I spoke with one of the principal installers of plasma in Washington and I mentioned these 57 facilities. He said, yes we are doing some of them, not all of them. They also have their offices in Madrid, Spain and he gave me a list of countries around the world that are using or are going to be installing plasma gasification. Now there are no emissions, don't forget that, but the CO₂ is used to

generate the electricity.

FACILITATOR: Sir, we have to give the panel members an opportunity to respond.

Q: We, in Northumberland, will have to go through this same process fairly soon. I would hope that you would make a good example so that we don't waste a lot of time. Thank you.

A: I want to tell you that the Region of Durham does not support or promote any specific technology in this class of technology. At the same time, incinerators, gasification, plasma are all part of this cluster of thermal technologies. In the next few days, the Region of Durham is going to issue a Request for Qualification (RFQ), to move forward with this project. Any companies representing any of these technologies will be able to make a submission to the Region. Once again, we are not promoting any specific technology, but anybody representing plasma will be able to respond to our RFQ.

Q: I'm from Bowmanville. I too am a supporter of plasma technology and some of my concerns have been addressed by previous

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WHAT WE DID IS THERE IS
A MODEL THAT THE US EPA
HAS CALLED THE WASTE
MANAGEMENT DECISION
SUPPORT TOOL.

questioners. I'm concerned particularly with the CO2 and mercury. The Province is telling us that we have to switch to neon lights, which contain mercury and they of course have to be disposed of as hazardous waste. I wondered if there has been a comparison with the CO2 emissions from landfill, which has been mentioned ad nauseam and what will be happening with the neon light bulbs once they are in full use by the entire Province? I understand this may not be part of the study that has been done, but where do they fit in the scheme and has there been a comparison to the CO2 emissions from landfill and plasma?

A: On your mercury question, we have what is called the Waste Diversion Act, which gives the MOE the power to designate materials that are to be managed by industry or product stewardship. The Minister has recently designated electronic and electrical equipment as a material to be managed. So, right now there are plans in the works where the industry, the people that create computers, there are a lot of old televisions with plasma and new flat screen TVs. There's a lot of electronic equipment including those compact florescent light bulbs that have mercury in

them. So, what I fully expect we will see in the next few years is a system of encouraging people to take their electronics and those light bulbs back to special, perhaps depots, perhaps collection. What the industry is working out is the system for managing those materials as a separate material and removing them from the waste stream. There is movement afoot to get that. Material that shouldn't go to landfill, it shouldn't go to an EFW facility. The system needs to be managed appropriately. In terms of the plasma and CO2, the synthetic gas is combusted. That combustion could be in an engine, it could be in a turbine. It creates potentially the same amount of CO2 per tonne of input waste as an incinerator or pyrolysis unit. They all produce about the same amount of CO2. Some plasma vendors claim they produce more electricity so they get less CO2 per kilowatt-hour of electricity, but they all produce about the same given the input waste.

Q: Actually, my question was whether a comparison for the CO2 from landfill had been done, plus the transportation costs getting the stuff there.

A: What we did is there is a model that the US EPA has called the Waste

Management Decision Support Tool. It takes transportation, the emissions from the facility, the energy substitution and the additional recycling into account. When we put a landfill and thermal treatment, be it gasification or combustion, through that model it found that the EFW facility produces less greenhouse gas emissions than the landfill.

Q: I live in Newcastle. Dioxins and furans are extremely toxic substances. There are scientists in the academic community who would, I'm sure, disagree with some of the things you have said. They are so toxic in fact that dioxins and furans are slated for virtual elimination under the Canadian EPA, the Federal Toxic Substances Management Policy and the Canadian Council of Ministers of the Environment Policy for the management for toxic substances. We have signed onto a convention in Stockholm that has the goal of virtual elimination of dioxins and furans. To that end, people have been working very hard to identify the greater sources of dioxins and furans and working to eliminate them. Many incinerators have been closed. Medical and municipal, mass burn as you are proposing here. So dioxin and furan levels have been declining. They are chlorinated compounds.

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I DON'T ADVOCATE FOR
ANY TECHNOLOGY, ALL I
DO IS SIMPLY LOOK AT THE
POTENTIAL RISK COMING OUT
OF A FACILITY.

They are created in the stack. It's not like they were put in the garbage and you are putting them back up, that may happen too, I guess, but you are actually creating them in the stack. So, you are adding to the world's source of dioxins at a time when the call wasn't to reduce, the call was to eliminate. Airborne dioxins travel continent to continent, not just locally and they are persistent and they bioaccumulate. From what I understand of your Study, you have done a health assessment looking at how much dioxin this one facility would produce and to see whether or not it was tolerable to someone in the maximum point of concentration. You haven't taken into account yet, and I'm thinking you will do that when you get to your site-specific study, the dioxin that comes from other sources. Will you also take into account the body burden we all presently have when you go to do your cancer risk assessment because we are already full of dioxins unfortunately. We have had a real problem since the 1940s, where we had all these dioxins and furans. So my question is this, how can we advocate putting in a facility that will add to this problem? You are now adding a new source of dioxins and furans that will contribute to a global problem. I

guess I would ask this to Dr. Ollson. How can you, as a Doctor in environmental studies, advocate building such a facility and saying that would be safe? Scientists still do not understand the toxicity of dioxins and furans.

A: I don't advocate for any technology, all I do is simply look at the potential risk coming out of a facility. You are absolutely right in many of the statements you have made in terms of the Stockholm Convention. Virtual elimination, these are all things that are out there, well documented and certainly we support as a scientific community. Because of the fact that they are so bioaccumulative and at the end of the day, that's more of a societal question. It's more of a question you folks need to answer for yourselves. It's a question that the Councillors and others and the MOE are going to have to answer. Should we be putting any of these things into the environment? What I can tell you is that we do support and stand behind the fact that the emissions from the facility that we looked at had some concerns, as I showed you for the dioxins and furans. But I do firmly stand behind the fact that from a first cut look at residents and toddlers in a daycare facility, the emissions, although there, it is a source,

would not pose an unacceptable risk. That being said, what we have not done yet is look at the acumulative risk from already existing levels of exposure. What I can tell you is that the report does provide a table that looks at what is called the Ontario Typical Background or Range of Chemicals in Soil. What we saw was that, for example, the dioxins and furans, if you assume that was at the site where you are, we would go and test and we will make sure of what those chemical concentrations are, is that the emissions from this facility over a 35-year period would increase that soil by 1%. I'm not suggesting that is good or bad, but that is what it is. It would be 1% typically and from some of the scenarios we looked at, would not pose an undue health risk. But more studies are going to have to be done. Whether or not we should be emitting these things, that is not something I can answer.

Q: Could I ask you to clarify body burden? Will you be taking into account body burden when you look at the cumulative affect?

A: Yes, with respect to the body burden, what is looked at there is the exposure that already occurs from current days. So, yes there will

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IN THE INDIVIDUAL EA ACT IN ONTARIO, IT DOES NOT SPECIFY THE REQUIREMENT TO LOOK AT CUMULATIVE EFFECTS.

be an accounting for existing body burden. For example, the transfer of dioxins and furans from mother to breast milk would not just be what this facility would be emitting. It would be in addition to and will show in the site-specific risk assessment the current loading and the current issues surrounding that.

Q: My question is a bit of a follow up. In April, Jim McKay said that you would be doing a cumulative impact assessment and generally, the Ontario EA Act doesn't require an assessment of cumulative impacts. So my question is, why are you doing one? How are you doing one? What protocols will you follow, etc.? And then Dr. Ollson mentioned that you, I think you, used the term cumulative loading. Then you say you are going to be doing baseline studies in all of this. I guess my concern is at what point will we get to comment on the factors, criteria and indicators that you will be assessing, so that we can ascertain that what you are assessing is indeed appropriate over the appropriate planning horizon, over the appropriate area for the appropriate issues?

A: The first question was how Jim said we would be looking at the cumulative effects.

You are absolutely right. In the individual EA Act in Ontario, it does not specify the requirement to look at cumulative effects. So the nice thing about an EA is that when you do one, you can choose to go further than whatever is written down. I can tell you from a health impact assessment and environmental impact assessment standpoint, cumulative impacts will be following essentially the same process that is required by the Canadian EA Act for cumulative effects. And that means that all sources that are there in the environment have to be considered. In addition to that, if there are any other facilities or projects that would have emissions, that are on the books, not built yet but that have been publicly disclosed, it would be similar to the impacts we might see from this. They also get taken into consideration. Durham and York Regions are going beyond what the requirements are.

A: The first question you are asking is what are the site-specific studies that are going to be done and will they be appropriate? I guess the first thing I can say to that is that the chemicals that are listed in here will be the ones, at a minimum, that will be looked at. We will be looking at more than just this

list because there are things that are not on this list that we will probably be concerned about that might come from the stack that we might include. We are just designing a lot of the studies right now. The air study is out there. I don't know why we couldn't provide the study design, publicly put it up on the website and have comments. The other thing is those studies will again be peer reviewed by others to make sure they are comfortable with what those study designs are going to be. Is there a formal back and forth for that? I don't know. We will make it public and look for comment.

Q: Many EA processes offer public input directly to help create the appropriate level of scrutiny to make sure the issues that are of concern to the public are identified and addressed. It's one thing to satisfy you, it's another thing to satisfy us.

A: Absolutely. The quick thing that I will say to that right now is that this comment period is not a requirement. I don't need to let this document stay open until the 31st of July. Nobody is making me do that, we've asked for that. Right now is a good time for you to provide comment as to the study, but

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THE SITE-SPECIFIC RISK
ASSESSMENT, WHICH WOULD
BE THE CUMULATIVE IMPACT
ASSESSMENT, CAN'T START UNTIL
WE HAVE A PREFERRED SITE AND
A PREFERRED VENDOR OF THE
TECHNOLOGY. SO, IT IS LIKELY
THAT WILL HAPPEN AFTER THE EA
SUBMISSION.

we are more than willing, if you have specific concerns or thoughts on background studies, that you would like to share with us right away. Absolutely. We will take those into consideration. It will be a living thing. We are not going to cut that off either.

Q: Not to push it, you didn't answer the question about the timing. When do you intend to do this cumulative impact assessment? At what point and in which study?

A: From the health side, that would be at the site-specific study. I have no idea when we are going to be asked to do that study. It depends on having the vendor and it depends on having things ready.

Q: After EA submission though?

A: The site-specific risk assessment, which would be the cumulative impact assessment, can't start until we have a preferred site and a preferred vendor of the technology. So, it is likely that will happen after the EA submission.

Q: I am a resident of Durham. A point

of clarification. I think I heard and I want to make sure of what I heard, that the public would have input into the actual licensing requirements of the facilities, that the standards that would be set would be somewhat influenced by that. I guess I have difficulty with that statement and I have heard it twice now, so I do want to clarify it. A previous presenter did refer to the Stockholm Convention. The Stockholm Convention is an international treaty that has been signed by over 128 countries. Canada was the first country to sign that Agreement. In that Agreement, there are international standards for dioxins, furans and mercury. The Canadian government has indeed signed onto those standards and Ontario has adopted them. The standard for mercury is 20 micrograms of dry cubic meter of flu gas corrected to standard conditions and 1 microgram would equal 1 millionth of a gram. This is defined by the MOE APC on Incinerators Policy 10-03-02. Secondly, the international standard which Canada has signed onto for dioxins and furans is 80 picograms per cubic meter, 1 picogram is 1 trillionth of a gram. Those are the site-specific criteria for those two emission standards, so it is not debatable.

It is international law and we cannot violate that. So I think that is important to state and I would really rather you refer to those measurements from now on please.

A: The first thing that I will say is, did you hear me correctly when I said that there will be public input into the Certificate of Approval for the facility? The answer to that is yes. When the Certificate is being prepared and when the process is going about, it gets posted to the Environmental Registry and there is a comment period for the public. Now will the Minister, when signing that Certificate of Approval, take in everything and do exactly what anybody writes in and asks? No, not necessarily, but it certainly is an open comment period. On the Stockholm Convention, you are right, those standards are there, but the Stockholm Convention provides standards, which have to be followed, and they are followed. The difference, I think, with the distinction being made there, where I say it's a societal issue, is that there is also written into the Stockholm Convention, the goal to achieve virtual elimination. That is not it, even though they provide standards, they then go further to say that is the standard, but we would like to have virtual elimination.

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WE WANT VALIDATED DATA
SHOWING THE SCALE THAT
IT WORKS AT AND THAT IT'S
RELIABLE AND ALL THOSE
GOOD THINGS. SO, WE
WELCOME THAT ADDITIONAL
INFORMATION.

What I am saying is that these facilities will emit dioxins and furans but they will comply with the law in terms of that. If this is what is selected, I can't answer the bigger societal question of whether or not that is acceptable to everybody in the room.

FACILITATOR: I just want to comment that you have the opportunity to write your questions out if you don't get them answered here this evening. Please remember that we have a session like this tomorrow evening in Newcastle, so there is another opportunity.

Q: This is for David Merriman, regarding the CO₂. You mentioned the gas from the plasma gasification is producing the same amount of CO₂. That is incorrect; it produces much less because the gas is cleaner. There is a method to remove the carbon and produce hydrogen so we have zero CO₂ emissions with that method without going into the combustion engine. The second method is we take the exhaust from the combustion engine and go into a micro-plasma facility and reduce the CO₂ to zero. My question to you Mr. Merriman would be, was there a specific reason why CO₂ was not included in that Study?

A: Our assumptions on CO₂ were based on just the conversion of carbon in the waste into carbon dioxide. We didn't take into consideration any additional technologies for sequestering or removing carbon dioxide. We would welcome seeing proven information on that from vendors. This is why there are many, many claims from many vendors out there and that is why we are doing this Request For Qualifications. That's why we want to hear about those technologies. We want validated data showing the scale that it works at and that it's reliable and all those good things. So, we welcome that additional information.

Q: I am a resident of Durham. If the incinerator is designed for 250,000 tonnes, does that mean when it is built in 2011 approximately, will it have to operate at full capacity?

A: The economics are generally better. It's like a mortgage. You have an expensive piece of equipment and it has a fixed mortgage payment on it, so the more you can use it, the lower the cost per tonne. From a technical perspective, the different technologies have different abilities to be turned down, if you

will. This mass burn incinerator, you could turn it down about 80%. Other technologies that are more modular, if you have five units, you could run four of them and switch one off. The desire to run it full time is an economic one to bring the cost per tonne down.

Q: So that means that we would be taking more garbage to burn outside of Durham and we're only taking 20% of York's now. That means we have to go out and search for garbage for a 250,000 tonne incinerator. Durham estimates 75,000 tonnes from Durham; we would be getting 62% from outside of Durham. We are taking other people's garbage. Our children's health, our health is affected by taking other people's garbage into this incinerator. If we have to do an incinerator, please just make it Durham's. We don't want other people's garbage.

A: Initially, York's contribution was much larger than it is right now. There was a report presented last week to Regional Council and Durham, together with York, is going to issue an RFQ for the facility of 150,000 tonnes capacity for the year 2011. We are now looking at a much smaller facility.

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WE REALIZED THAT BOTH
DURHAM AND YORK ARE VERY
FAST GROWING COMMUNITIES
AND WE WANT TO HAVE THE
ABILITY TO SCALE THE FACILITY
AND MEET FUTURE NEEDS.

Q: I was at a meeting last week and they asked permission to up the capacity to 250,000 tonnes, I wonder why?

A: This is for the future expansions. We realized that both Durham and York are very fast growing communities and we want to have the ability to scale the facility and meet future needs.

Q: It's gone from 250,000 tonnes to 150,000 tonnes back over to 250,000 tonnes.

FACILITATOR: I think you can talk to her a little later to get some clarification on that.

Q: I am a physicist and I reside in Oshawa. I have three questions. The first is a medical question. Is it true that there is an increasing body burden in terms of chemicals, as well as a decreasing fertility rate for the human species? Yes or no?

A: Quickly for the body burden question, some chemicals are going up and some chemicals are going down.

A: It's a controversy recently in the literature, but we don't have any evidence one way or

the other. A paper that I think created some local stir was, I think, the Great Lakes Health Affect Study done on gender differences in Aboriginals in southwestern Ontario, something like that? Okay. It was published in late 2005 or 2006. That has generated a lot of editorial comment and a lot of systematic review comment. The most recent one I think, published about two or three months ago and I can get you the reference so that you can judge for yourself perhaps, but the answer is we don't know and those studies are highly biased, the ones that show this tremendous shift, one way or the other.

Q: We don't know, so we should adopt a precautionary approach.

FACILITATOR: Sir, let her finish.

A: You asked a question. That's the best answer I can give you. We can engage in debate perhaps and not subject other people to it, but I'm happy to provide those references to you and then perhaps we can talk about it, okay?

Q: Isn't it true that the standards have changed over time; they were generally

tightened over time? We found in light of experience that what we thought was good enough x number of years ago, is now not good enough and we have tightened those standards, isn't that true? Yes or no?

A: Some of the standards have gone up due to environmental conditions. Many have been lowered over the years, so the answer is yes. There is a long list of reasons as to why that is, but yes, standards have gone lower over the years, certainly they are lower from 30 years ago.

Q: I commend you for doing a capacity analysis on the ultimate capacity, you mentioned 400,000 tonnes. This is the way to do it in my view, look at the maximum size and then not be caught short. But even if I take the representative value of tonnage per annum that is being given, I was wondering if you can give me an idea of the associated truck traffic related to that in terms of vehicles. Because if we have the same type of relatively small vehicles that bring the waste to the depot, whatever it may be, incineration, plasma, whatever it is, then the economics are not very favourable to it because of the distance traveled, especially for waste coming

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from a fair distance away. It seems to me that it would imply the need for transfer stations, in other words mini-dumps along the way. My question is, if we assume that there is an average tonnage, which is certainly per truck, which is certainly higher than what is on a residential street, we end up with a certain amount of traffic. Have you looked at that because the figures are really horrendous and I don't know if people are willing to put up with these numbers?

A: Because Durham and York export most of their waste to Michigan, there are transfer stations already. We are planning on continuing to use those transfer stations, so waste would be coming in about 30 tonne trailers. In our comparison of the Short-List of sites, we are doing a traffic study where we are identifying the specific number of trucks coming to each of the facilities and the associated transportation impacts. We will be sharing that information at a future public meeting.

Q: Am I to understand that there will be transfer stations to consolidate the tonnage into larger vehicles to reduce the traffic at the incineration point?

A: And those transfer stations are in existence and in operation today.

Q: Are we assuming that it is going to be 365 days a year or 220 days a year? Certainly there is no garbage pick up on the weekend and at night. There are a lot of scenarios we can look at here.

A: For the purposes of comparing the sites, we are planning on delivery during the daytime, five days a week and a storage pit at the facility so it can run continuously.

Q: I just want people to be aware that's a truck about every three minutes.

Q: I have a personal card here. On the back are five different plasma operations and the reason I brought this is simply because I did have one phone call ask me what company I was associated with and the answer is none. I have spent hundreds of dollars because I have been interested in this for 25 years at least. Now, also, I have a sheet here that gives you a comparison of the plasma method and incineration and there are a lot of interesting comments. Anybody who wishes one, I have a number of copies. Thank you.

Q: What I would like to know is, should this project be scrapped given that Durham has said that there will be no landfill? What happens when all these hundreds of thousands of trucks bearing our garbage are refused entry because everyone else says deal with your own garbage, Durham Region?

A: This is the most difficult question. I don't know what is going to happen if we don't have our own solution. This summer I am going to issue an RFQ for short-term landfill capacity. We are going to see what the response will be. After this information comes to me, I will be able to give you a better answer.

FACILITATOR: Thank you for your questions.

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THIS SUMMER I AM GOING TO
ISSUE AN RFQ FOR SHORT-
TERM LANDFILL CAPACITY.

QUESTIONS NOT ASKED DURING THE SESSION:

Questions from the June 27, 2007 “I didn’t get a chance to say...” Forms

1. If more than 1 person is exposed to cancer as a direct link to this facility, will this facility be shut down or will it continue to kill our families and friends?

The purpose of undertaking a site-specific risk assessment is to ensure that emissions from the facility would not be at a high enough concentration to cause cancer. In the event that emissions exceed the safe limits the facility would be required to shut down until they can demonstrate that they can operate safely.

2. How many people are aware of this proposed new facility at this time and what are their feelings about it?

We do not know how many people are currently aware of the proposed facility, however we have made every effort to inform the public of this project. All of the information sessions held regarding the Durham York Residual Waste Study are

publicized in local and regional newspapers as well as on Durham and York’s websites. Durham and York Regions recognize that it is difficult to get information to all of their residents and are continually searching for new methods of informing their residents about projects such as this study.

We have received a wide range of opinions regarding this project, ranging from highly supportive to highly opposed.

3. Have they gone door-to-door within a 12 km radius of the sites within Courtice and Bowmanville?

Residents within a 1 km radius of each of the short-listed sites received hand delivered notices. Other residents of the community were notified via ads in the local papers.

4. Have any politicians any intentions of going door-to-door to get their constituents’ view on this important matter?

We are not aware of any specific plans to do this at this time.

5. You had a wonderful PowerPoint

presentation. Why was there not a slide with the bio of the speakers? What type of doctors are they?

Dr. Chris Ollson is Jacques Whitford’s National Director of Environmental and Occupational Health Sciences. He has a PhD in Environmental Science, specializing in environmental toxicology and risk assessment. Dr. Ollson has 11 years of experience in the public health field and holds an Adjunct Professorship at the Royal Military College of Canada and Memorial University.

Dr. Lesbia Smith is a medical doctor (MD) with specialty training in internal medicine and hematology/oncology, and more than 30 years of experience in public health entirely dedicated to environmental and occupational health, mostly within a provincial government setting. Dr. Smith is also Assistant Professor with the Department of Public Health Sciences, Gage Occupational and Environmental Health Unit, Associate of the Institute for Environmental Studies, University of Toronto; and also Clinical Research Associate of the Institute of Environment and Health, McMaster University.

6. The Brampton facility has been operating for 15 years. Do they have a St. Mary's Cement that is discharging into the air along with the gases that are already in the air from the burning of garbage? Please do not compare sites if they are not the same.

There are no cement production facilities in close proximity to the Brampton Energy-From-Waste facility. However, there are other industrial sources of air emissions in Brampton.

7. Why are municipal buildings in Clarington not composting? At an event held in Bowmanville, I took 4 full large bins of composting home to put out. No composting program was in effect at that building. Clean your own mess before polluting future generations' air.

The current curbside contract with the Region of Durham allows for pickup of the residential waste only. The Municipality through the 2008 budget process will consider implementing a green bin program for all recreation/ municipal buildings.

8. There is better technology available than incineration. Garbage can be converted to carbon emissions practically. What can we do with the carbon? Carbon is in everything. How about developing uses, like building products, asphalt, cement, etc. Why flog a dead horse? Incineration is inefficient. Money? Who wants to pay indefinitely, incineration is too expensive. The problem is being studied to death.

In any thermal treatment process, most of the carbon contained in the incoming waste is converted to carbon dioxide. The carbon dioxide gas is discharged from the stack. New technologies for sequestering and using carbon may emerge in the future.

9. It has been stated that the incinerator will only emit toxins at MOE acceptable levels, yet has any study been done to see what toxins the people of Clarington are exposed to already from industries that surround us, i.e. St. Mary's Cement, Darlington Nuclear Reactor, Pickering Nuclear Reactor, General Motors? I am sure when the toxins from other industries in our area and this incinerator are considered, we will definitely be beyond acceptable levels of toxins. It's no wonder everyone is dying from cancer.

Currently baseline air quality data from in and around the chosen sites is being collected. Once a site is chosen, more site-specific information will be collected and will thus give us a better understanding of current conditions.

10. There are papers that confirm that incinerators cause cancers and other illnesses. Have they been considered?

Specific papers have not been considered for this generic risk assessment. The type of study conducted is a mathematical-based exercise to determine potential health risk; scientific papers would be included and addressed in a literature review, which was

not done here.

11. Was human error factored into the exposure risks?

Exposure risks calculations were carried out by professionals in risk assessment and care was taken to ensure all risks predicted were calculated correctly. In addition, calculated exposure risks were reviewed by other risk assessment professionals both internally and externally through peer review.

12. The slide with the red boxes, is this a single year and are the cumulative effects studied anywhere, i.e. it might not be risky at 10% per year, but might be red after 10 years of exposure?

The red boxes correspond to calculated risks at 35 years, when the maximum concentration of chemicals would be predicted to be in the environment. This is a conservative approach to calculating exposure risk, as at this point, receptors would be exposed to the highest environmental levels of chemicals from the thermal treatment facility.

13. Is there a financial benefit to the consulting firms if this process is not cancelled midstream?

The Consultants working on the Durham York Residual Waste Study are paid for the services that they provide. There are no financial benefits to the consulting firms if this process is not cancelled midstream.

14. Has runoff from onsite deposits been studied?

The management of runoff from onsite deposits will be examined and considered as part of the site-specific studies that are currently being carried out at each of the short-listed sites. All waste storage and management activities will be inside the facility building so runoff from the waste will not be an issue.

BIOGRAPHIES

Christopher Ollson, Ph.D., QPRA Director Environmental & Occupational Health Sciences Jacques Whitford Limited

Dr. Ollson is Jacques Whitford's National Director of Environmental and Occupational Health Sciences. Dr. Ollson is located within the Burlington office of Jacques Whitford and is recognized by the Ontario Ministry of the Environment as a Qualified Person Risk Assessment under Ontario Regulation 153/04 and as a Qualified Toxicologist through the Air Standards Development Branch. Dr. Ollson has a PhD in Environmental Science, specializing in environmental toxicology and risk assessment.

He is responsible for the performance of health professionals across Jacques Whitford, ensuring the highest quality and technical standards of our reports, senior project review, financial accountability and overseeing training programs for intermediate/junior risk assessors.

Throughout his career, Dr. Ollson has led numerous multidisciplinary environmental health assessments and facilitated community consultation and risk communication for both industry and government agencies. Dr. Ollson is also a recognized expert in the field of oral bioavailability of contaminants in the environment and a founding member of the Bioavailability Research Canada (BARC) working group and Bioavailability Research Group Europe (BARGE). Dr. Ollson also maintains an active research program in the field of Environmental Toxicology and holds Adjunct Professorship at the Royal Military College of Canada and Memorial University. Through these affiliations he supervised graduate students at both the Masters and PhD levels

Dr. Lesbia Smith, MD Environmental & Occupational Health +Plus

Dr. Lesbia Smith is a medical doctor (MD) with specialty training in internal medicine and hematology/oncology and more than 30 years experience in public health entirely dedicated to environmental and occupational health, mostly within a provincial government setting.

Dr. Smith established Environmental & Occupational Health +Plus in 2000 to provide specialty consulting services on a broad spectrum of environmental and occupational health projects that typically require expert advice on specific issues. Her clients include provincial ministries, federal departments, public health units, workers compensation boards, private individuals and selected industries.

Dr. Smith is also Assistant Professor, Department of Public Health Sciences, Gage Occupational and Environmental Health Unit, Associate of the Institute for Environmental Studies, University of Toronto; and also Clinical Research Associate of the Institute of Environment and Health, McMaster University.

For this project, Dr. Smith provided an external review of the generic study from a public health perspective, putting into context the history of the issue under consideration, the objectives of the study, and the consequences of the findings for public health in general.

Elliot Sigal, B.Sc., QPRA, Executive Vice President Intrinsic Environmental Sciences Inc.

Elliot Sigal is a Senior Scientist and Executive Vice President of Intrinsic Environmental Sciences Inc. Mr. Sigal graduated with an Honours B.Sc.

in Toxicology from the University of Toronto in 1988. He has had direct, senior level experience on human health risk assessments since the mid-1990s. He has overseen and contributed to hundreds of risk assessments since 1989. Mr. Sigal is a full member of the Society of Toxicology and qualifies as a QPRA under Ontario's Record of Site Condition Regulation (O. Reg. 153/04).

Mr. Sigal has experience in all aspects of toxicology and risk assessment. Mr. Sigal has been responsible for leading risk assessment teams in determination of potential for exposure of and risk to receptors associated with complex contaminated sites, military base closures, underground storage tanks, incinerator/WTE emissions, landfill sites and industrial processes. Mr. Sigal has been involved in the use of toxicological principles to facilitate the risk assessment process, such as the development of a health-based method for the evaluation of total petroleum hydrocarbons (TPH), and provision of a benchmark comparison of remediation alternatives, in order to determine economically feasible and scientifically sound solutions to risk management problems. Mr. Sigal has conducted interpretive reviews of toxicology and mechanistic databases for a variety of chemicals including metals (i.e., arsenic, nickel), chlorinated organics (i.e., vinyl chloride, PCBs, dioxins and furans), volatile organic compounds (i.e., benzene, toluene), combustion gases (NOX, SOX), and PAHs (i.e., benzo[a]pyrene). Mr. Sigal has conducted peer reviews on many risk assessments in jurisdictions across Canada and the U.S., and has conducted reviews of risk assessments on behalf of the Ontario Ministry of the Environment.

