STONEY CREEK URBAN BOUNDARY EXPANSION – EAST PORTION

WATER AND WASTEWATER MASTER SERVICING PLAN

November, 2008

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TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 Purpose of Study

On October 23, 2003, City of Hamilton Council adopted Regional Official Plan Amendment (ROPA) No. 14 and Stoney Creek Official Plan Amendment (OPA) No. 99 to permit the expansion of the urban area in lower Stoney Creek. These amendments were appealed by the Ministry of Municipal Affairs and Housing and Hamilton General Homes. In February 2005, the Province released the final Greenbelt Plan which placed one third of the proposed Stoney Creek Urban Boundary Expansion (SCUBE) area in the Greenbelt.

On November 22, 2005, the Ontario Municipal Board (OMB) held a pre-hearing to deal with the Amendments. After testimony and comments, the OMB directed the City, Province and parties to the hearing to bring forward an amendment acceptable to all parties. This resulted in OMB Decision/Order No. 1202 issued on April 30, 2007 with an Official Plan Amendment. The decision allowed lands outside the Greenbelt area to be designated "Urban" and that a Secondary Plan be developed for the area before any development proceeds. The Board also indicated there would be a future OMB hearing to deal with the appropriateness of the Greenbelt designated lands for 3 properties and one area that were identified at the pre-hearing. The remaining lands within the Greenbelt area will remain in the Greenbelt Plan and landowners may not take part in the future hearing.

ROPA No. 14 and OPA No. 99, both amended by the OMB, have added 223 hectares (550 acres) to the City of Hamilton Urban Area in the lower Stoney Creek/Winona area. The limits of the SCUBE area are presented in Figure 1.1.

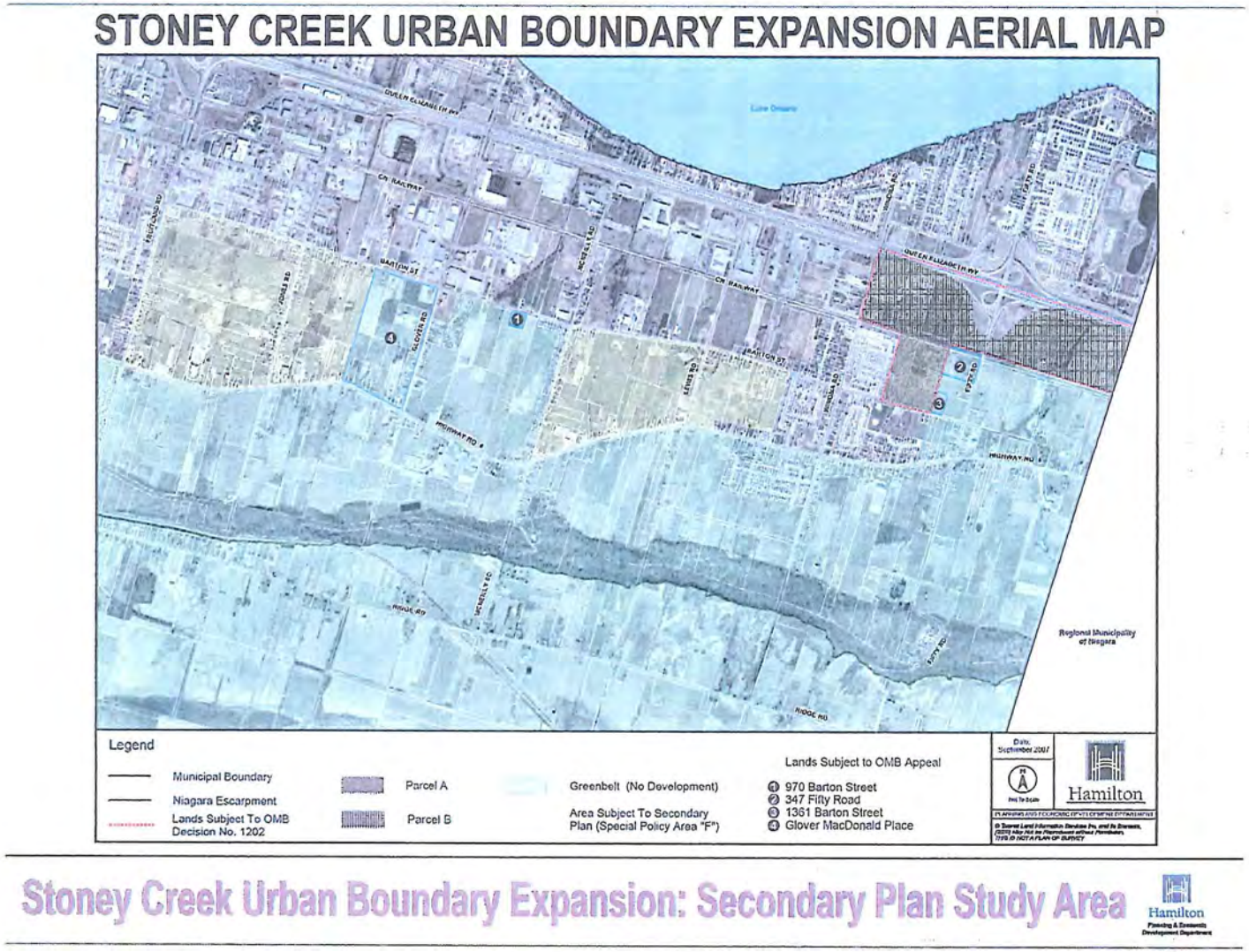


Figure 1.1 – SCUBE Limits

Amendment No. 99 to the Stoney Creek Official Plan designated the Stoney Creek Urban Expansion area as Special Policy Area "F". The Policies for Special Policy Area "F" provide for the lands identified as Parcels A and B (Refer to Figure 1.1) to proceed to development in advance of the remaining lands of SPA "F" subject to the completion of specified studies. These studies include a General Land Use Concept, Commercial and Employment Studies, Transportation Analysis, and lastly, water, wastewater and storm water analysis for the drainage area.

The Terms of Reference for the Water and Wastewater Servicing Master Plan for Parcels A & B (hereafter referred to as SCUBE–East) were developed on behalf of the Landowners by Philips Engineering Ltd., with input from the City. The Study has been undertaken in co-operation with the City.

1.2 Municipal Class EA – Master Servicing Plan

The Class EA process is a mechanism by which municipal servicing is provided in an efficient, timely, economical and environmentally responsible manner. It represents a consistent, streamlined and easily understood process for planning and implementing municipal infrastructure projects. It is recognized that it is beneficial to begin the planning process by considering a group of related projects, or an overall system, e.g. water, wastewater and/or roads network, or a number of integrated systems (e.g. infrastructure master plan as a master plan) prior to dealing with project specific issues. Master planning provides the municipality with a broad framework through which the need and justification for specific projects can be established and the environmental assessment process can be satisfied.

Master Plans are defined as long range plans which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles in the Municipal Engineers Association document titled *Municipal Class Environmental Assessment (June 2000 Amended October 2007).*

Key features of Master Plans include the following:

- addresses the key principles of successful environmental planning;
- addressed at least the first two phases of the Municipal Class EA and can also cover other phases;
- allows for an integrated process with other planning initiatives;
- provides a strategic level assessment of various options to better address overall system needs and potential impacts and mitigation;
- is generally long term;
- takes a system wide approach to planning which relates infrastructure either geographically or by a particular function;
- recommends an infrastructure master plan which can be implemented through the implementation of separate projects, and
- includes a description of the specific projects.

The *Municipal Class Environmental Assessment (October 2000, as amended 2007)* provides four approaches that may be used by Municipalities to undertake a Master Plan:

- **Approach #1:** This approach involves the preparation of a Master Plan document at the conclusion of Phases 1 and 2 and would be made available for public comment prior to being approved by the municipality. The Master Plan would be done at a broad level of assessment thereby requiring more detailed investigations at the project-specific level. The Master Plan would therefore become the basis for, and be used in support of, future investigations for the specific Schedule B and C projects identified within it. Schedule B projects would require the filing of the Project file for public review while Schedule C projects would have to fulfill Phases 3 and 4 prior to filing an Environmental Study Report (ESR) for public review.

- **Approach #2**: This approach involves the preparation of a Master Plan document at the conclusion of Phases 1 and 2 of the Municipal Class EA process where the level of investigation, consultation and documentation are sufficient to fulfill the requirements for

Schedule B projects. The final public notice for the Master Plan could become the Notice of Completion for the Schedule B projects within it. Any Schedule C projects, however, would have to fulfill Phases 3 and 4 prior to filing an ESR(s) for public review. The Master Plan would provide the basis for future investigations for the specific Schedule C projects identified within it.

- **Approach #3:** This approach involves the preparation of a Master Plan document at the conclusion of Phase 4 of the Municipal Class EA process. In this approach one document is prepared: the Master Plan to document Phases 1 to 4 of the Class EA process for Schedule B and/or Schedule C projects. Therefore, the final public notice for the Master Plan could become the Notice of Completion for the Schedule B and C projects within it.

- **Approach #4 - Integration with the Planning Act**: Given the broad scope of Master Plans, it may be appropriate to integrate with approvals under the Planning Act. For example, the preparation of a new official plan or a comprehensive official plan amendment could be accompanied by master plans for water, wastewater and transportation. When these planning documents are prepared simultaneously, alternatives can be assessed taking into account land use and servicing issues while addressing a preferred alternative which minimizes, to the extent possible, the impact on the community, natural environment and the economy.

The Master Planning process used for this project is consistent with the requirements outlined for Approach #2 in which the Master Plan was prepared at the conclusion of Phases 1 and 2 of the Municipal Class EA process. The final public notice for the Master Plan is the Notice of Completion for the Schedule B projects within it. The Schedule C projects, however, would have to fulfill Phases 3 and 4 prior to filing an ESR(s) for public review.

Figure 1.3 illustrates a simplified version of the Master Planning Process used for this project.

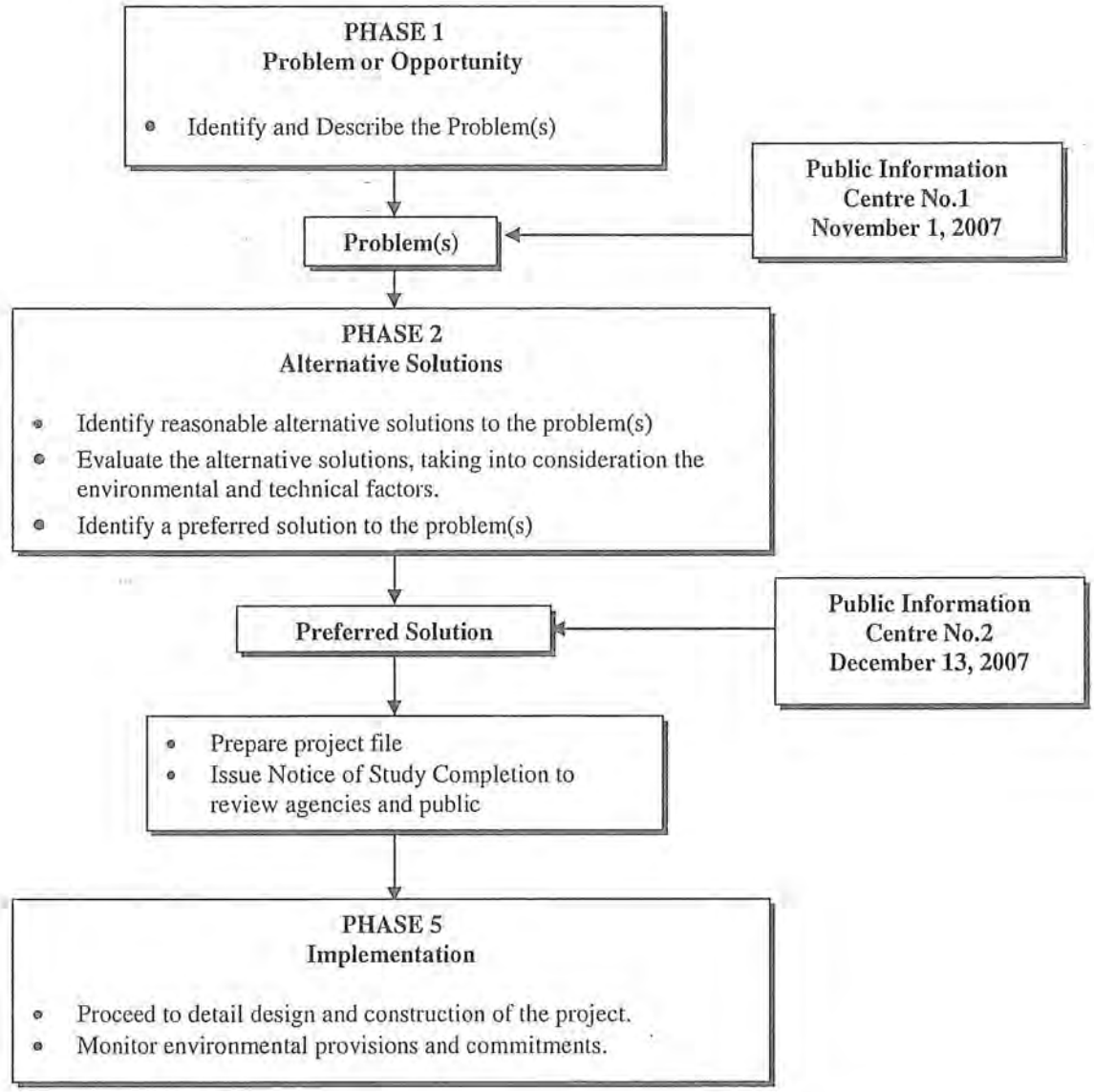


Figure 1.3 - Illustration of the Master Planning Process.

Problem / Opportunity Statement

The City of Hamilton has identified a need and/or opportunity to develop the Stoney Creek Urban Boundary Expansion (SCUBE) area and will prepare a Secondary Plan in 2008. Landowners in SCUBE - East are prepared to initiate the development process immediately, and to accommodate this development, water and wastewater infrastructure extension will be required to service the area.

This Master Plan has been prepared to guide the extension of water and wastewater services required for existing and future land uses within the SCUBE – East area.

Stakeholder and Agency Consultation

Phase 1 – Notice of Study Commencement and Public Information Centre No.1

A Notice of Study Commencement and Public Information Centre, detailing the study area, summarizing the objectives of the study, requesting comments, and advertising the first Public Information Centre was submitted to relevant stakeholders, and agencies by mail, on October 19, 2007. In addition, a Notice of Study Commencement and Public Information Centre was published in the Grimsby News and the Stoney Creek News on October 19th and 26th by the City of Hamilton. Responses were received from several stakeholders and agencies. Copies of the newspaper advertisement, letters to stakeholders and agencies, copies of all comments received and written responses and Public Information Centre material are contained in Appendix 'A1'.

The following agency contacts have participated in the study:

Kathy Pounder	-	Niagara Escarpment Commission
Ann Newman	-	Enbridge Pipelines
Miranda Lesperance	-	Indian and Northern Affairs Canada – Ontario
Darylann Perry	-	CN
Barbara Ryter	-	Ministry of the Environment

Kevin Clement	-	Indian and Northern Affairs Canada – Comprehensive Claims Branch
Mike Stone	-	Ministry of Natural Resources
George Montour	-	Six Nations of the Grand River
Jonathan Allen	-	Indian and Northern Affairs Canada - Litigation Management and Resolution Branch

Public Information Centre No. 1 (PIC No.1) was held on Thursday, November 1, 2007 at the Stoney Creek Municipal Service Centre. Seven (7) attendees signed the register. Display boards were prepared to summarize the municipal class environmental assessment process, background information, the problem identified, existing conditions and next steps. Generally, the attendees were aware of the project. General comments voiced at the PIC were related to potential impacts to specific sites/property within the study area. Comments sheets were available at the PIC but no comments were submitted.

Phase 2 – Public Information Centre No.2

Public Information Centre No. 2 (PIC No.2) was held on Thursday, December 13, 2007 at the Stoney Creek Municipal Service Centre. The notice of Public Information Centre No.2 was published in the Grimsby News and the Stoney Creek News on November 30th and December 7th by the City of Hamilton. Three (3) attendees signed the register. Display boards were prepared to summarize the municipal class environmental assessment process, background information, the problem identified, existing conditions, alternative solutions for water and wastewater, evaluation factors/criteria, evaluation of alternatives, and the description of the preferred alternative for water and wastewater.

Generally, the attendees were in favour of the project. Comments sheets were available at the PIC and there were two comments sheets submitted. The comments requested continual notification of the project and that the project notification should be in conjunction with the SCUBE Planning Study. The other comment was concerning the watermain on Fifty Road

(Highway 8 to Barton Street) and the resident requested to be contacted when the project goes in front of City Council. The information related to PIC #2 is included in Appendix 'A2'.

Filing of Master Servicing Plan

All parties previously having expressed an interest in the project will be notified by letter, regarding the completion and filing of the Master Servicing Plan. In addition, a Notice of Completion will be placed in the local newspaper, the Grimsby News and the Stoney Creek News.

Copies of the Master Servicing Plan will be made available at the following locations:

Hamilton Public Library
Stoney Creek Branch
777 Highway 8
Stoney Creek, ON L8E 5J4
Hours:
Mon./Wed. - 1:00 p.m. to 8:00 p.m.
Tues./Thurs./Sat. - 10:00 a.m. to 5:00 p.m.
Fri./Sun. - Closed

Clerks Desk
Hamilton City Centre
77 James Street North
Hamilton, ON L8R 2K3
Hours:
Mon./Fri. - 8:30 a.m. to 4:30 p.m.

Public Works Department
Hamilton City Centre
77 James Street North, Suite 320
Hamilton, ON L8R 2K3
Hours:
Mon./Fri. - 8:30 a.m. to 4:30 p.m.

A review period of not less than thirty (30) days will be provided, during which comments will be received from stakeholders and agencies.

1.3 Study

The Stoney Creek Urban Boundary Expansion (SCUBE) study area consists of the lands bounded by Fruitland Road, Highway No. 8, western limits of Winona and Barton Street and lands bounded by the eastern limits of Winona, Highway No. 8, CN Rail, South Service Road and City limits. Figure 1.1 illustrates the limits as set out in the OMB Decision of April 30, 2007. SCUBE-East is located in the eastern portion of the Stoney Creek development area, and is outlined in Figure 1.1. Two development areas, Parcel A of 12.72 ha and Parcel B of 49.79 ha comprise SCUBE-East. Since the study area is restricted to the SCUBE-East area only, water and wastewater services within or adjacent to the Study Area with the capability of servicing lands within the Study area were examined. A review of available information will be used at the outset in an effort to identify options for servicing of SCUBE-East. This information is presented in Section 1.4.

1.4 Background Review

The Background review includes a review of information related to the SCUBE–East and has been prepared in support of the development of the Water and Wastewater Master Servicing Plans for SCUBE–East.

The summary also provides a review of servicing reports completed for the lands proposed for development by Flying J Inc. and Mady Development Corporation. The Flying J Inc. lands are approximately 7.34 ha, front onto the South Service Road and are located approximately 200 m east of Fifty Road. The Mady Development Corporation Lands are approximately 19.28 ha, and are generally bounded by the South Service Road to the north, CNR lands to the south, Winona Road to the east and Fifty Road to the west.

A summary of the following reports has been provided (listed chronologically by date of issue):

Report	Author / Consultant	Date of Issue
Class EA – Basement Flood Relief Study, City of Stoney Creek	Aquafor Beech Limited	November 1998 (Draft)
Remedial Measures for Sewer Back-up and CSO Control	Mark Stirrup, M.Eng., P.Eng., Regional Municipality of Hamilton-Wentworth	1999
Water Distribution & Wastewater Collection Analysis, Urban Boundary Expansions (City of Hamilton (former City of Stoney Creek))	Aquafor Beech Limited	January 10, 2003
City of Hamilton, Development Charge Background Study	C. N. Watson and Associates Ltd. in association with Earth Tech Canada and Philips Engineering Ltd.	May 19, 2004
Hamilton Development Charges Background Study, Water and Wastewater Projects	Earth Tech	May 2004
Preliminary Servicing Report for Flying J – Travel Plaza, City of Hamilton (Stoney Creek)	A. J. Clarke and Associates Ltd.	August 2005
Preliminary Engineering Report, Mady Development Corporation, Q.E.W. & Fifty Road, In the City of Hamilton	S. Llewellyn & Associates Limited	February 2006
City of Hamilton, 2006 Development Charges Update Study	C. N. Watson and Associates Ltd.	May 2006
City of Hamilton, Water and Wastewater Master Plan, Class Environmental Assessment Report	KMK Consultants Limited	November 22, 2006

It should be noted that these are previous reports and some of the work mentioned in these reports may have been undertaken, while others may have been replaced by subsequent studies.

- **Class EA – Basement Flood Relief Study, City of Stoney Creek, Aquafor Beech Limited (November 1998 (Draft))**

This report was prepared for the Regional Municipality of Hamilton-Wentworth as a component of a Class Environmental study. The Class EA was initiated by the Region in response to complaints of untreated sewage backing up into basements in Stoney Creek (in the area bounded approximately by Grays Road to the west, Fruitland Road to the east, Lake Ontario to the north and North Service Road to the South).

Problem Identification – Causes of Flooding

The review outlined below was undertaken in order to identify the cause or causes as to why untreated sewage has backed up into basements within the study area.

- The condition of the existing sanitary sewer system was reviewed by undertaking video inspections (to check sewer condition) and smoke and dye testing (to test for illegal connections).
- Existing sewage flows were monitored during both dry and wet weather conditions to determine the magnitude of sewage flows exiting the three (3) study areas.
- A computer based hydraulic analysis of the sanitary sewer system in Stoney Creek, and of the wet well at the Woodward Avenue WWTP, was undertaken to determine if there were any system wide conditions contributing to basement flooding within the three (3) study areas.

Recommendations

1. Although all three (3) areas were susceptible to basement flooding, the Grays Road Sanitary Drainage Areas appeared to be at the most risk of flooding. The preferred alternatives were to be phased, the Grays Road Pumping Station be given high priority.

2. It was recommended that smoke and dye testing be undertaken in the Grays Road Sanitary Drainage Area prior to implementation of the preferred alternative as flow monitoring suggested that there existed some direct connections, increasing stormwater inflows.
3. The identified sags and deficiencies in the sanitary sewer system were to be monitored by the Region (i.e. through additional video inspections) and the affected sanitary sewers were to be replaced as required.
4. Cleaning of the sanitary sewers in the study area was to be undertaken every 1 to 3 years to help maintain drainage efficiency.

- **Remedial Measures for Sewer Back-up and CSO Control, Mark Stirrup, M. Eng., P. Eng., Regional Municipality of Hamilton-Wentworth (1999)**

This paper was prepared for presentation at an Educational Program Innovations Centre (EPIC) on Combined Sewer Overflows (CSOs) in 1999. The purpose of the paper was to present potential solutions to CSO flooding and pollution problems, and remedial measures which have been implemented in Hamilton Wentworth Region.

A number of reports were received in October, 1995 and January, 1996 of untreated sewage backing up into basements in three areas within the City of Stoney Creek (near Grays, Green and Dewitt Roads). These areas are connected to the Eastern Sanitary Interceptor (ESI), which conveys sanitary sewage to the Woodward Avenue WWTP. The collection system in this area was designed as a separate sewer system, but experiences high flows during wet weather which are the result of high inflow/infiltration (I/I) within the sanitary sewer system.

In 1997, the Region retained a consultant to undertake a Class EA study to identify the cause(s) of basement flooding, identify various alternatives to reduce the potential for basement flooding, and finally to recommend a preferred alternative or alternatives to reduce the potential for basement flooding. The study was completed in June, 1999 (Aquafor Beech Limited, 1999).

Video inspections were completed to determine the condition of the existing sanitary sewer system and identify any possible obstructions to flow, and smoke and dye testing was undertaken to test for the existence of illegal connections of storm sewers to sanitary sewers. Smoke and dye testing found only one illegal connection within the three study areas, but also indicated that outside of these areas, approximately 53 properties (just over 2% of the properties tested) had illegal connections of private storm drains to sanitary sewers. During wet weather, these connections will increase the flow in the ESI. Video inspections found some obstructions in all three areas, generally due to accumulations of silt and debris caused by flat sewer grades and low flowrates during dry weather. One sagging pipe and one broken pipe were also identified.

Rainfall and sewage flows were monitored and compared to theoretical flow capacities within the sewer system to ensure that sufficient capacity existed to route sewage flows from the study areas. Measured dry weather flows were much less than available pipe capacity, indicating that the existing sanitary sewer system had plenty of capacity during dry weather. Measured flows during wet weather conditions were higher than those during dry weather, but still indicated that the sanitary sewer systems had sufficient capacity to convey flows to the ESI. Average inflow and infiltration rates within the sewer systems in the Green and Dewitt Road areas were approximately 0.3 l/s/ha, within the Regional Design Standards of 0.2 - 0.4 l/s/ha. These measurements agreed well with the findings from the smoke testing which found few if any illegal connections in these areas. However, I/I in the Grays Road area averaged 0.7 l/s/ha, suggesting that some direct connections of storm sewers to sanitary sewers existed in this area.

Possible external impacts from the sanitary and combined sewer systems outside the three study areas were also investigated with the help of the USEPA SWMM Runoff and Extran modules. Basements within the study areas were typically found at elevations between 75.5 m and 76.5 m. Normal operating levels in the Woodward Avenue WWTP wetwell were generally around 66.0 m.

The Region has implemented a number of changes to reduce the potential for sanitary sewage backups in Stoney Creek. After the January, 1996 event, the maximum operating level for the Woodward Avenue WWTP wetwell was set at 70.0 m. This adjustment has decreased water levels in the sanitary sewer systems in the three study areas. Two water level sensors were installed in the ESI to inform plant operators of water levels within the ESI. If the observed levels begin to rise, the operators could increase pumping rates at the WWTP and thereby decrease the water levels in the sewers. All six Woodward Avenue WWTP raw sewage pumps were replaced with new pumps, which had increased pumping capacity by about 20-25 percent. Two new CSO storage tanks were constructed after January 1996. This reduced wet weather flows in the WSI and helped to reduce water levels in the system. All sanitary sewers in the study area were cleaned in 1997 to remove debris increasing system efficiency.

- **Water Distribution & Wastewater Collection Analysis, Urban Boundary Expansions (City of Hamilton (former City of Stoney Creek)), Aquafor Beech Limited, January 10, 2003**

The City of Hamilton retained Aquafor Beech Limited to undertake a planning level trunk watermain and sanitary sewer servicing analysis for lands being considered for urban boundary expansion in the City of Hamilton (formerly the City of Stoney Creek.) The servicing analysis identified trunk infrastructure requirements, dependencies, costs and timing associated with the Stoney Creek urban boundary expansion; the analysis was intended to assist staff with secondary plan review and development proposal submission assessment.

This letter report summarized the results of the analysis undertaken for the Stoney Creek Urban Boundary Expansion. The expansion area considered was generally bounded by Barton Street to the north (the railway and QEW east of Winona Road), Highway No. 8 to the south, the Winona Urban area and generally Fruitland Road to the west and the Municipal Boundary to the east. Figure 1.1 in the Report (lower Stoney Creek Urban Boundary Expansion) illustrated the location of the expansion area relative to local roads and existing watermain and sanitary sewer infrastructure.

Recommendations and Conclusions:

The analysis undertaken for this study determined that due to the pre-servicing undertaken by the City both the Water and Sanitary systems had sufficient capacity to serve the urban expansion area.

The report concluded **that no watermain works were required to service the urban expansion area**; however the development of the urban expansion area provided an opportunity to enhance the security of supply of the eastern portion of water main pressure district H1 through interconnecting the Fifty Road watermain to the northern portion of the system. Interconnecting the watermain would require construction of a new watermain north of the QEW, construction of a jack and bore with liner pipe watermain beneath the QEW, and oversizing of the development infrastructure. Approximately $600,000.00 would be required to facilitate the watermain interconnection; however as stated previously this work was not required to service the urban boundary expansion, but would enhance the security of water supply within the eastern portion of H1.

Sanitary servicing of the urban expansion area east of Fifty Road was determined to be possible through the existing infrastructure, however pending more detailed information as to the proposed development grading; it was assumed that a 600 mm diameter extension of the Eastern Interceptor would be required to service the eastern portion of the urban expansion area. Preliminary engineering calculations provided by the City indicated that a 600 mm diameter extension was required to service the ultimate development. **Approximately $600,000.00 would be required to extend the Eastern Interceptor to service the east portion of the urban expansion lands**. "Green field" sanitary servicing of the east portion of the expansion lands would probably require approximately 900 m of 450 to 200 mm sanitary at a nominal depth of 3 m. Based on contracts tendered at the time of writing, installation of the sanitary sewer would require approximately $120.00 per metre and $3500.00 per manhole; assuming 9 manholes construction of the "greenfield" sanitary sewer could be undertaken for approximately $170,000.00. An oversizing cost of approximately $430,000.00 would therefore be associated with extending the 600 mm sanitary sewer to Fifty Road.

- **City of Hamilton, Development Charge Background Study, C. N. Watson and Associates Ltd. in association with Earth Tech Canada and Philips Engineering Ltd. (May 19, 2004)**

This report was prepared for the City of Hamilton as required by the Development Charges Act (DCA). The report followed the methodology established by the DCA.

The City, in accordance with the City of Hamilton Act, has the by-laws of the former municipalities in force until they expire, are repealed or amended. The first by-law expired on July 6, 2004. The City was required to undertake the development charge public process and pass a new by-law prior to the expiry date.

This study provided the basis for The City of Hamilton Bylaw No. 04-145, adopted by Council on June 16, 2004.

The report recalculated development charges based on future identified needs, on a municipal wide basis for all services except stormwater, water and wastewater (which were imposed on development within the urban service areas), transit (which was to be imposed on development within the urban transit service area) and the area specific charges for Glanbrook and Dundas / Waterdown.

The report represented the service needs arising from residential and non-residential growth over the forecast periods (urban build-out for water, wastewater and stormwater management; 17 years for roads and related, police and fire; and 10 years for all other services). Council was to consider the findings and recommendations of the report in conjunction with public input, for the adoption of policies and rates that Council deemed appropriate. The report suggested that these directions could refine the draft DC by-law, and may include:

- adoption of the charges and policies recommended by the report;
- consideration of additional exemptions to the by-law;

- consideration of the reductions in the charge by class of development (obtained by removing certain services on which the charge is based and/or by a general reduction in the charge), and;
- consideration of phasing in the charge over a period of time.

- **Hamilton Development Charges Background Study, Water and Wastewater Projects, Earth Tech (May 2004)**

This technical report was prepared as a background document for the City's Development Charges By-law. The report is an update to the Development Charges Background Study, June 1999, prepared by Marshall Macklin Monaghan Limited. This document provides engineering input on growth related future costs of water and wastewater infrastructure upgrades.

The objectives of this study were:

- Identify the demand that will be placed on the community's municipal water and wastewater system as a result of new development within the urban boundary.
- Recommend water and wastewater infrastructure required to service the expected new development needs in the two planning horizons 0 to 5 year and 6 year to urban boundary build-out (UBBO).
- Provide growth related project cost estimates for water and wastewater infrastructure eligible for DC funding in the two development periods.

Water Distribution System

Stoney Creek Lower

The report determined that a watermain was required for looping on old Highway 8 to Barton Street at Lewis Road. This would improve water flow and pressure to the non-residential development area north of Barton Street.

Location, size and cost of the projects for this area are summarized in the following tables:

Stoney Creek Lower Water Distribution System Development Charges Works (Planning Period – 0 to 5 Years)

Item	Project/ Street	From	To	Length (m)	Required Size for Urban Build Out (mm)	Unit Cost ($/m)	Estimated Total Cost	City Share (%)	Developer Contribution Based on 300 mm Cost	City Cost[3]	Direct Developer Contribution[4]	Development Charges[5]	Post Period Benefit[6]	Comment
1	Winona Rd.	Hwy 8	Barton	440	400	640	282,000	0	0	0	0	282,000		Annex B-3, 92 SC Background DC Study 1999
2	Glover Rd.	Lakeshore Rd.	South Service Rd.	420	300	500	210,000	0	0	0	0	210,000		Annex B-3, 96 SC Background DC Study 1999
3	Fifty Rd.	Barton St.	North Service Rd.	1400	400	640	896,000	0	0	0	0	896,000		Identified by City
4	Arvin Ave. Extension	350 m west of McNeilly Rd.	McNeilly Rd.	350	300	360	126,000	0	360	0	126,000	0		Within development unit cost does not include restoration
5	Arvin Ave. Extension	550 m east of Jones Rd.	Jones Rd.	550	300	360	198,000	0	360	0	198,000	0		Within development unit cost does not include restoration
6	Arvin Ave. Extension	McNeilly Rd.	350 m west of Winona Rd.	1500	300	360	540,000	0	360	0	540,000	0		
7	Replacement on Hwy 8	420 m east of Glover Rd.	McNeilly Rd.	450	400	500	225,000	0	0	0	0	225,000		Servicing pending UBB Area
8	Replacement on Hwy	McNeilly Rd.	Lewis Rd.	1000	300	500	500,000	0	0	0	0	500,000		Servicing pending UBB Area
9	Replacement on Lewis Rd.	Hwy 8	Barton St.	500	300	500	250,000	0	0	0	0	250,00		Servicing pending UBB Area
10	McNeilly Rd.	Barton St.	Railway	550	300	500	275,000	0	0	0	0	275,000		
11	Glover Rd.	Barton St.	Service Rd. Extension	700	300	500	350,000	0	0	0	0	350,000		
Total Stoney Creek Lower (0 to 5 Years)							**3,852,000**			**0**	**864,000**	**2,988,000**	**0**	

Notes:

1. Watermain cost includes supply, install and restoration in urban setting.
2. Refer to Financial Policy for Development Charges for details on Development Charge assessments.
3. City share applies where the proposed watermain services the existing water system's users
4. If there is more than 1 development benefiting from the new watermain through a developer's property, developer contribution for the watermain is the cost up to the threshold size (300 mm)
5. All servicing cost that benefits multiple new developments is included in development charges.

Stoney Creek Lower Water Distribution System Development Charges Works (Planning Period – 6 Years to UBBO)

Item	Project/ Street	From	To	Length (m)	Required Size for Urban Build Out (mm)	Unit Cost ($/m)	Estimated Total Cost	City Share (%)	Developer Contribution Based on 300 mm Cost	City Cost[3]	Direct Developer Contribution [4]	Development Charges[5]	Post Period Benefit[8]	Comment
1	Millen Rd.	South Service Rd.	Barton St.	1000	400	640	640,000	0	0	0	0	640,000		Annex B-3, 84 SC Background DC Study 1999
2	South Service Rd.	Jones Rd.	Millen Rd.	2745	400	640	1,757,000	0	0	0	0	1,757,000		Annex B-3, 85 SC Background DC Study 1999
3	Dewitt Rd.	CNR Tracks	Barton St.	610	300	500	305,000	0	0	0	0	305,000		Annex B-3, 86 SC Background DC Study 1999
4	Jones Rd.	South Service Rd.	Barton St.	915	400	640	586,000	0	0	0	0	586,000		Annex B-3, 88 SC Background DC Study 1999
5	Fifty Rd.	Hwy 8	Barton St.	245	300	500	123,000	0	0	0	0	123,000		Annex B-3, 94 SC Background DC Study 1999
6	Winona Rd.	Service Rd.	Petit Rd.	250	300	500	125,000	0	0	0	0	125,000		Annex B-3, 99 SC Background DC Study 1999
Total Stoney Creek Lower (6 Years to UBBO)							**3,536,000**			**0**	**0**	**3,536,000**	**0**	

Notes:

1. Watermain cost includes supply, install and restoration in urban setting.
2. Refer to Financial Policy for Development Charges for details on Development Charge assessments.
3. City share applies where the proposed watermain services the existing water system's users
4. If there is more than 1 development benefiting from the new watermain through a developer's property, developer contribution for the watermain is the cost up to the threshold size (300 mm)
5. All servicing cost that benefits multiple new developments is included in development charges.

Wastewater System

Stoney Creek Lower

The report determined that a new pumping station would be required to service the development areas north of the QEW in the Fifty Road area, as well as east of Fifty Road. An outlet for this pumping station would require the extension of the South Service Road trunk sanitary sewer east to Fifty Road.

Location, size and cost of the projects for this area are summarized in the following tables:

Stoney Creek Lower Sanitary Sewage System Development Charges Works (Planning Period – 0 to 5 Years)

Item	Project/ Street	Manhole		Length (m)	Required Size for Urban Build Out (mm)	Unit Cost ($/m)	Estimated Total Cost	City Share (%)	Developer Contribution Based on 300 mm Cost	City Cost[3]	Direct Developer Contribution[4]	Development Charges[5]	Post Period Benefit[6]	Comment
		From	To											
1	Falcon Rd.	Fifty Rd.	Existing Gravity Sewer MH SN01A047	220	250	610	134,000	0	0	0	0	134,000		
2	Arvin Avenue Extension	250 m east of McNeilly Rd.	McNeilly Rd.	250	375	380	95,000	0	380	0	95,000	0		Within development, unit cost does not include restoration
3	Arvin Avenue Extension	300 m west of Lewis Rd.	Lewis Rd.	300	375	380	114.00	0	380	0	114,000	0		Within development, unit cost does not include restoration
4	Arvin Avenue Extension	250 m west of McNeilly Rd.	McNeilly Rd.	250	375	380	95,000	0	380	0	95,000	0		Within development, unit cost does not include restoration
5	Lands East of Jones Rd.	Jones Rd.	250 m east of Jones Rd.	250	375	380	95,000	0	380	0	95,000	0		
6	Lands East of Lewis Rd.	Lewis Rd.	300 m east of Lewis Rd.	490	375	380	186,000	0	380	0	186,000	0		
7	Extension to Bridge Port Subdivision	Ex. Off Jones Rd.	Bridgeport Subdivision	230	300	370	85,000	0	370	0	85,000	0		
Total Stoney Creek Lower (0 to 5 Years)							**804,000**			**0**	**670,000**	**134,000**	**0**	

Notes:

1. Unit cost of sanitary sewer based on 2001/02 awarded contracts and info from Capital Planning & Implementation and Planning & Development. Unit price adjusted by increasing 10%.
2. Refer to Financial Policy for Development Charges for details on Development Charge assessments.
3. City share applies where the flows from the existing sanitary sewage system contributes to new sewer.
4. If there is more than 1 development benefiting from the new servicing through a developer's property, developer contribution for the sewer through the property is the cost of required services up to the threshold size (450 mm)

All servicing costs that benefit multiple developments that are required on existing public/non-development property are included in development charges.

Stoney Creek Lower Sanitary Sewage System Development Charges Works (Planning Period – 6 Years to UBBO)

Item	Project/Street	Manhole		Length (m)	Required Size for Urban Build Out (mm)	Unit Cost ($/m)	Estimated Total Cost	City Share (%)	Developer Contribution Based on 300 mm Cost	City Cost[3]	Direct Developer Contribution[4]	Development Charges[5]	Post Period Benefit[8]	Comment
		From	To											
1	Lakeside Dr.	300 m west of Jones Rd.	Jones Rd. MHSJ02A064	300	250	610	183,000	0	0	0	183,00	0		Private Road
2	Commercial Development	South / west of Fifty Rd. Interchange		330	375	450	149,000	0	0	0	0	149,000		
3	South Service Road	Fifty Rd.	250 m west of Winona Rd.	1100	600	600	660,000	0	0	0	0	660,000		
4	North Service Road	Millen Rd.	Dewitt Rd.	900	250	440	396,00	0	0	0	0	396,000		
5	Forcemain – South Service Rd.	P. S.	Fifty Rd.	450	200	430	194,000	0	0	0	0	194,000		
6	Pumping Station @ South Service Rd. / Fifty Rd.				235 L/s		533,000	0	0	0	0	533,000		
Total Stoney Creek Lower (6 Years to UBBO)							**2,115,000**			**0**	**183,000**	**1,932,000**		

Notes:

1. Unit cost of sanitary sewer based on 2001/02 awarded contracts and info from Capital Planning & Implementation and Planning & Development. Unit price adjusted by increasing 10%.
2. Forcemain unit cost is the equivalent of 2002 watermain unit cost provided by the City. Cost adjusted by increasing 10%.
3. Refer to Financial Policy for Development Charges for details on Development Charge assessments.
4. City share applies where the flows from the existing sanitary sewage system contributes to new sewer.
5. If there is more than 1 development benefiting from the new servicing through a developer's property, developer contribution for the sewer through the property is the cost of required services up to the threshold size (450 mm)
6. All servicing costs that benefit multiple developments that are required on existing public/non-development property are included in development charges.

Preliminary Servicing Report for Flying J – Travel Plaza, City of Hamilton (Stoney Creek), A. J. Clarke and Associates Ltd. (August 2005)

This report was prepared for Flying J Inc. to determine the availability of water and wastewater municipal services for the proposed development of the Flying J – Travel Plaza. Stormwater servicing and management were not addressed in this report.

The subject property is located to the south east of the Queen Elizabeth Way and Fifty Road interchange. To the north it is bounded by the South Service Road and agricultural lands immediately to the east. Canadian National Railway lands abut the property to the south. A 24.4 m wide Hydro One easement is located along the south limit of the site. To the west the site is bounded by vacant property owned by the Province of Ontario fronting onto South Service Road and Fifty Road, and by the lands of Hydro One.

It was proposed to construct a travel plaza with a restaurant, gas bar and parking lot facilities capable of accommodating 106 cars, 11 recreational vehicles and 144 trucks.

The existing Fifty Creek enters the site from the south, passing through the south east corner of the site for approximately 40 m, and leaves the site at the easterly property line. The creek continues to flow in the north east direction through the agricultural lands immediately to the east.

Municipal Services

Watermains

At the time of writing, there were no municipal watermains available at South Service Road.

In the 0 – 5 years planning time period category, the City of Hamilton Development Charge Background Study recommended installation of 1400 m of 400 mm watermain. This watermain is an extension of the existing 500 mm watermain at Barton Street and it was proposed to be

located at Fifty Road north of Barton Street, along the south-eastbound on-ramp to QEW, cross under the Queen Elizabeth Way and connect to the existing watermain at Baseline Road.

As per discussion with the City of Hamilton staff, this watermain was scheduled to be designed in 2005. (Construction of the 400 mm watermain was completed in 2007.)

Sanitary Sewers

At the time of writing, there were no municipal sanitary sewers available at South Service Road within the study area.

The existing 1200 mm municipal sanitary sewer trunk at South Service Road terminates to the west of Oriole Avenue, approximately 1300 m west of the subject site west limits.

In the 6 plus years (to Ultimate Build Out) planning time period category, the 2004 Development Charge Background Study report recommended extension of the existing municipal sanitary sewers to the east by installation of 1100 m of 600 mm sanitary sewer along the South Service Road to the intersection with Fifty Road, installation of 450 m of sanitary forcemain east of Fifty Road, and installation of sanitary pumping station at South Service Road, located approximately at the north-east limits of the subject site.

The servicing of the property by municipal sanitary sewers would require the extension of the sanitary trunk sewer, and the construction of a forcemain and pumping station by the developer in advance of the City's time table.

- **Preliminary Engineering Report, Mady Development Corporation, Q.E.W. & Fifty Road, In the City of Hamilton, S. Llewellyn & Associates Limited (February 2006)**

This report was prepared for Mady Development Corporation to assess the existing conditions and servicing for the proposed development site and determine the preliminary engineering services required for the proposed development.

The report indicated that the proposed development site is located at the southwest quadrant of the interchange of Fifty Road and the South Service Road in Stoney Creek, and the proposed development was to be comprised of 12 commercial/office buildings.

Proposed Services

Storm Drainage

The existing culverts under the QEW corridor were sized to convey the runoff from the subject lands as fully developed (approximately 73% impervious coverage). The Hamilton Conservation Authority had requested that the post-development runoff from the subject lands be controlled to pre-development levels.

The entire site was divided into two subcatchments and a pond block:

- Subcatchment A, 14.0 ha in total, drains to the proposed SWM facility and further through the existing 2.4 m x 1.2 m open footing concrete culvert.
- Subcatchment B, 4.61 ha in total, drains through the existing 1.8 m x 1.2 m open footing concrete culvert. Parking lot storage is to be employed to capture post-development runoff.

Quality control will be provided through the SWM facility for Subcatchment A and through Stormceptor for Subcatchment B.

Sanitary Sewers

Sanitary flows from the site will outlet to the existing 1200 mm dia. sanitary sewer on the South Service Road, at the intersection of Oriole Avenue.

The sanitary sewer will be oversized to accommodate the future sanitary flows from the lands to the east and south of the site. A 9.0 m service easement, in favour of the City of Hamilton, is anticipated to be proposed on site. It is anticipated that there will be a cost sharing agreement with the City of Hamilton and the neighbouring landowners for the construction costs associated with construction of the proposed 600 mm dia. sewer on this development.

The report noted that there are concerns with the hydraulic grade line in the trunk sanitary sewer on the South Service Road. As a result, the report recommended that no gravity connections to basements be permitted in this development.

Watermains

The subject lands will be serviced from existing watermains located on Winona Road and Fifty Road.

The City of Hamilton is proposing a new watermain on Fifty Road, crossing the QEW, in 2007, which will provide sufficient water supply to the subject lands.

A 300 mm dia. watermain is proposed to service the subject lands, connecting the existing 300 mm dia. watermain on Winona Road and to the future watermain on Fifty Road.

Road Construction

Winona Access Road will be reconstructed to an urban standard as part of this development.

- **City of Hamilton, 2006 Development Charges Update Study, C. N. Watson and Associates Ltd. (May 2006)**

This report was prepared for the City of Hamilton as an update to the report "Hamilton Development Charge Study" issued May 19, 2004.

The charges recommended in the 2004 study provided the basis for Bylaw 04-145, adopted by Council on June 16, 2004. The residential charges were imposed commencing on July 6, 2004, with the previous charges for the former areas being continued until that time.

The purpose of the amendment was to make adjustments to the projects and costing as a result of:

- adjustments to reflect actual cost vs. budget, for projects undertaken between 2004-2006,
- update the benchmark estimates used in the calculation of the project estimate
- adjustments to land costs (Stormwater)
- to add or delete projects

The study also provided recommended rules governing the calculation, payment and collection of development charges in accordance with Section 6 of the Development Charges Act, including:

- Payment in any Particular Case
- Determination of the Amount of the Charge
- Application to Land Redevelopment
- Exemptions (full or partial)
- Indexing
- The Applicable Area
- Categories of Services for Reserve Fund and Credit Purposes
- By-law Duration
- Date Charge Payable

Additionally, the study presented the following polices for Council's consideration:

- Development Charge Rate Phase in Schedule
- Development Charge Deferral Agreement
- Maximum Reimbursement for Stormwater Management Ponds
- Permanent Transition Policy
- One-Time Residential Transition Policy

The following tables present the total amended development charges for water and sanitary services by project listing:

Stoney Creek Lower Water Distribution Charges Works (Planning Period – 0 to 5 Years)

Item	Project / Street	From	To	Estimated Total Cost ($)	City Cost ($)	Direct Developer Contribution ($)	Development Charges ($)	Post Period Benefit ($)	Updated Budget Cost / Actual	Engineering Benchmark Adjustments	Project Removed	Project Added
1	Winona Rd.	Hwy. 8	Barton St.	454,000	0	0	454,000		X	X		
3	Fifty Rd.	Barton St.	North Service Rd.	2,013,000	0	0	2,013,000		X	X		
Total Stoney Creek Lower (0 to 5 Years)				**5,820,000**	**0**	**838,000**	**4,982,000**	**0**				

Stoney Creek Lower Water Distribution Development Charges Works (Planning Period – 6 Years to UBBO)

Item	Project / Street	From	To	Estimated Total Cost ($)	City Cost ($)	Direct Developer Contribution ($)	Development Charges ($)	Post Period Benefit ($)	Updated Budget Cost / Actual	Engineering Benchmark Adjustments	Project Removed	Project Added
5	Fifty Rd.	Hwy 8	Barton St.	166,000	0	0	166,000		X	X		
6	Winona Rd.	Service Rd.	Petit Rd.	169,000	0	0	169,000		X	X		
Total Stoney Creek Lower (0 to 5 Years)				**5,225,000**	**0**	**0**	**5,225,000**	**0**				

Stoney Creek Lower Sanitary Sewage System Development Charges Works (Planning Period – 6 Years to UBBO)

Item	Project / Street	Manhole		Estimated Total Cost ($)	City Cost ($)	Direct Developer Contribution ($)	Development Charges ($)	Post Period Benefit ($)	Updated Budget Cost / Actual	Engineering Benchmark Adjustments	Project Removed	Project Added
		From	To									
2	Commercial	South / West		267,000	0	267,000	0		X	X		

Item	Project / Street	Manhole		Estimated Total Cost ($)	City Cost ($)	Direct Developer Contribution ($)	Development Charges ($)	Post Period Benefit ($)	Updated Budget Cost / Actual	Engineering Benchmark Adjustments	Project Removed	Project Added
		From	To									
	Development	of Fifty Rd. Interchange										
3	South Service Road	Fifty Road	250 m west of Winona	1,147,000	0	573,500	573,500		X	X		
5	Forcemain – South Service Rd.	P. S.	Fifty Rd.	242,000	0	0	242,000			X		
6	Pumping Station @ South Service Rd. / Fifty Rd.			666,000	0	0	666,000					
Total Stoney Creek Lower (6 Years to UBBO)				**3,139,000**	**0**	**1,294,500**	**1,844,500**					

- **City of Hamilton, Water and Wastewater Master Plan, Class Environmental Assessment Report, KMK Consultants Limited (November 22, 2006)**

This report was prepared for the City of Hamilton, to provide the City with a water and wastewater servicing strategy in support of the preferred growth option identified by the Growth Related Integrated Development Strategy (GRIDS) and adopted by Council on May 24, 2006. This Master Plan Report, including all Appendices, was the documentation placed on public record for the Class EA review period.

The Water and Wastewater Master Plan for the Lake Based System is comprised of three documents, namely:

- **Baseline and Optimization Report:** completed a review of the existing infrastructure and identified opportunities and constraints with respect to optimizing and servicing of future growth. This was a technical study that was used as one of the key inputs into the Integrated Water and Wastewater Master Plan for the Lake Based Systems.
- **Water and Wastewater Master Plan Policy Paper:** completed and endorsed by Council on May 11, 2005, provided a framework for planning water and wastewater infrastructure.
- **Integrated Water and Wastewater Master Plan for the Lake Based Systems:** followed the Municipal Class Environmental Assessment process which was integrated with the Transportation and Stormwater Master Plans through GRIDS.

The Study Area for this Master Plan consisted of the existing lake-based water and wastewater servicing area, which extended to the Urban Boundary, plus any urban boundary expansion areas that were required to service the anticipated growth between the date of the report and 2031.

Water System

At the time of the Master Plan, the existing water system for the study areas consisted of the Woodward Ave. WTP, a series of booster pumping stations, reservoirs, elevated storage tanks and the distribution system. Based on the change in topography (including the Niagara Escarpment) and the wide geographical service area, numerous Pressure Districts had been established to maintain adequate levels of service.

The water system was set up to pump water through the Pressure Districts to the limits of the system. The transmission of water to each pumping station and reservoir was not provided through dedicated transmission mains but was conveyed through larger diameter trunk watermains. In some Pressure Districts, multiple trunk watermains distributed flow through the system.

Water Design Criteria

Unit Water Demand Criteria

The Master Plan established overall residential and employment rates based on historical data. They are presented in the following table:

Criteria	Value
Average Day Residential Consumption	300 Lpcd
Average Day Employment Consumption	260 L/employee/d
Maximum Day Factor	2.0
Peak Hour Factor	3.0

Through the historical data analysis, it was noted that localized areas and users can exceed the above criteria. As such, it is recommended that for area-specific analyses, the traditional City of Hamilton criteria of 360 Lpcd for residential and 125 equivalent person/ha for employment be used.

Fire flow rate criteria generally follows the MOE Guidelines with most Pressure Districts being planned for 250 L/s. It should be noted that the 250 L/s fire flow is an area-wide generalization only.

Wastewater System

Eastern Sanitary Interceptor

The Eastern Sanitary Interceptor (ESI) runs east-to-west along Lake Ontario, from Oriole Avenue to the Woodward Avenue WWTP. It receives sanitary sewage from the former municipality of Stoney Creek only.

Data collected during the City's 2004 Flow Monitoring Program indicate moderate wet weather inputs into the Eastern Interceptor. The data also indicated that at no point in 2004 did the flows through these trunks exceed even 35% of their capacities, indicating that the Eastern Sanitary Interceptor system is significantly oversized when considering the population that it services, and the fact that it receives no combined sewage. When the ESI was originally constructed, it included an allowance for development of the lands south of the existing service area, which are now protected by the Greenbelt Plan.

While the ESI has excess capacity at the present time, it can experience backwater conditions depending on the wet well level at the Woodward Avenue WWTP influent pumping station. When the elevation in the wet well is high, the effective conveyance capacity of the ESI is reduced.

Woodward Avenue Wastewater Treatment Plant

The Woodward Avenue WWTP is a secondary treatment facility that services the urban areas of the existing City of Hamilton, with the exception of the former Town of Dundas and the central portion of the former Town of Waterdown. It is the principal facility for treating wastewater flows for a significant portion of the City of Hamilton.

The flows from Ancaster, Mount Hope, the Upper Mountain, Binbrook and Stoney Creek consist of separated sanitary flows, with some rainfall-derived inflow and infiltration. There are still many combined sewers within the central core of the City, so the Woodward Avenue WWTP receives a combination of sanitary and storm flows from this area. As a result, the Woodward Avenue WWTP experiences significant wet weather flows of up to four times the average dry-weather rate. Flows are conveyed to the plant through the Western Sanitary Interceptor, and the Eastern Sanitary Interceptor. Currently, the plant has a rated capacity of 409 ML/d and is operating at approximately 85 percent of the rated capacity. Treated effluent is discharged to Hamilton Harbour via the Red Hill Creek.

The facilities at this site incorporate the low lift pumping station, primary and secondary treatment of liquid flows, and treatment of biosolids within conventional anaerobic digesters. The facility has significant methane gas storage and recently co-generation facilities have been constructed to capitalize on this asset.

At the time of the Master Plan, the facilities had been the subject of a number of recent and on-going studies and upgrades. A comprehensive scoping study was competed by CH2MHill, which demonstrated, amongst other topics, that the site could accommodate the growth anticipated to 2031. The City was in the process of upgrades to achieve enhanced primary treatment to 1100 ML/d capacity and had initiated a study of membrane bioreactors as a technology that might be suitable for enhanced tertiary treatment.

A biosolids master plan was also underway and it was expected that a preferred alternative was not likely to be adopted until early 2007. The master plan specified that recognizing the inter-relationship between the biosolids process and the rest of the plant and recognizing the scope of this master planning document, the total requirements for the Woodward Avenue Wastewater Treatment Plant will only be completed during Phases 3 and 4 of the Class EA to be initiated specifically for that purpose.

While the low lift pumping station was upgraded several years ago, limiting capacity of the original wet well continues to be problematic for operations.

Wastewater Design Criteria

Average Day Dry-Weather Flow

Based on review of historical data and given that the GRIDS forecasts were provided in residential persons and employees, the dry-weather flow criteria was established. The criteria are presented in the following table:

Criteria	Value[1]
Residential	300 Lpcd
Employment including industrial, commercial, and institutional (ICI):	260 L/employee/d

[1] This value is applicable only for City wide analysis. 360 Lpcd for Residential criterion and 125 equivalent person/ha for Employment criterion are to be used for area-specific analyses

Peak Wet-Weather Flows

For existing developed catchments within the existing urban boundary, it was assumed that the storm runoff from the existing catchments would not increase through redevelopment or intensification. While the actual hydrologic properties of the catchments likely would change, it is anticipated that stormwater control measures would also be implemented such that the post-development (i.e. future) rates of runoff would not exceed the pre-development rates (the existing conditions).

The extraneous flow rate criteria for future development, is based on a wet weather design allowance of 0.4 L/ha/s. This is consistent with the City's existing design standards.

2.0 WATER DISTRIBUTION

2.1 Existing Conditions

Existing water servicing in the SCUBE-East Study Area consists of:

- 400 mm watermain on South Service Road located east of Fifty Road (crossing north across the QEW at approximately 180 m east of Fifty Road)
- 400 mm watermain on Fifty Road located south of South Service Road;
- 300 mm watermain on South Service Road, located west of Winona Road;
- 300 mm watermain on Winona Road, located between South Service Road and Service Road;
- 200 mm watermain on Winona Road, located between Service Road and Barton Street;
- 200 mm watermain on Service Road;
- 200 mm watermain on Sonoma Line.

This information is illustrated in Figure 2.1.

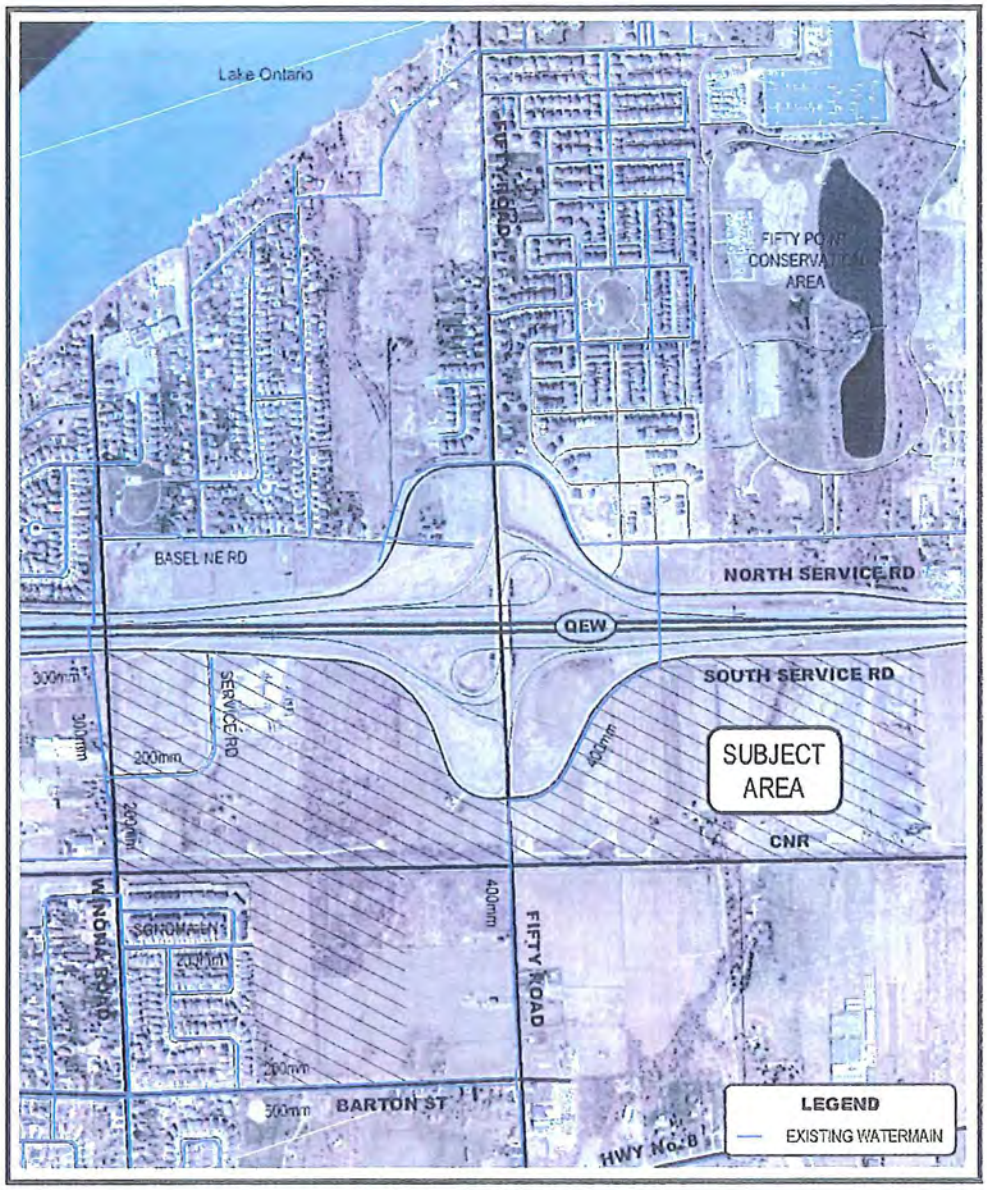


Figure 2.1 - Existing Conditions - Water

3.0 WASTEWATER COLLECTION

3.1 Existing Conditions

Existing wastewater collection in the SCUBE-East Study Area consists of:

- 1200 mm sewer located in the South Service Road right-of-way, located 200 m west of Winona Road at the Oriole Avenue intersection;
- 600 mm sewer along Winona Road, flowing north towards Victoria Avenue and then west along Victoria Avenue to Oriole Avenue;
- 250 mm sewer along Sonoma Line.

This information is illustrated in Figure 3.1.

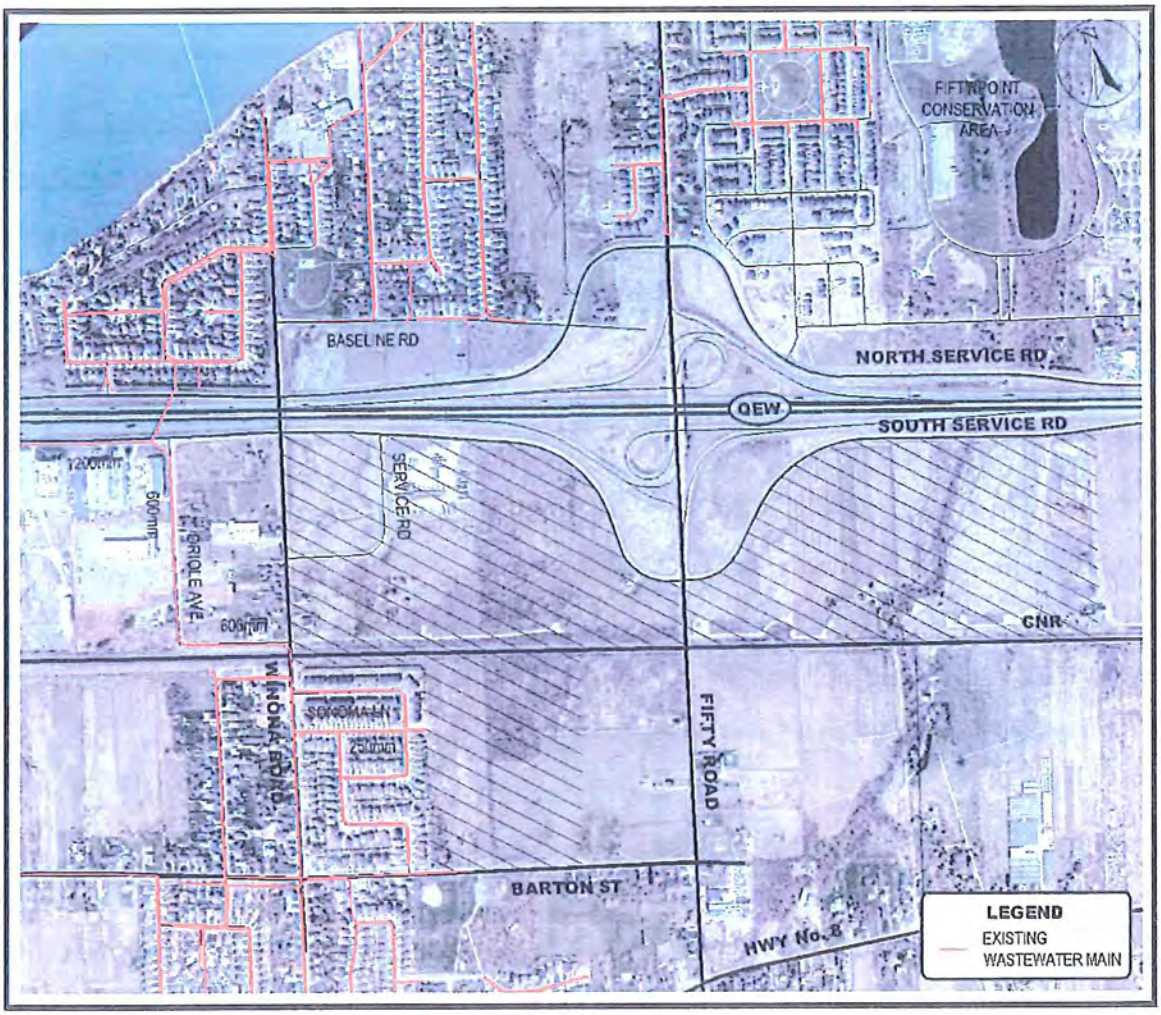


Figure 3.1 - Existing Conditions - Wastewater

4.0 SERVICING ALTERNATIVES

The Municipal Class EA process requires the consideration of alternatives, including the "Do Nothing", to address the problem/opportunity statement. For the Water and Wastewater Master Servicing Plan for SCUBE-East, the alternatives developed require the extension of existing services which have been designed and constructed previously with the ultimate development of lands in east Stoney Creek in mind. In all, three (3) alternatives have been identified for both the water distribution system and the wastewater collection system.

The "Do Nothing" alternative for SCUBE-East would result in the status quo for the water distribution system and the wastewater collection system. In essence, this would prevent the development of the SCUBE-East lands, as approved through the inclusion of the lands within the urban boundary. Therefore, the "Do Nothing" alternative does not address the problem/ opportunity statement and will not be considered further.

4.1 Water Distribution System

In Section 2.0, the available water distribution mains are identified. The watermains will generally be extended or connected to in order to service the SCUBE-East Study Area. To that end, Philips identified three distinctive servicing options for the Study Area.

4.1.1 Alternative 1 - Water

Water servicing of the land parcels within SCUBE-East consists of:

- Extension of the watermain on the South Service Road from Winona Road, easterly to the Town of Grimsby boundary, to service Parcel B using existing rights-of-way, and
- Extension of the watermain on Sonoma Lane easterly and a new connection to the trunk watermain on Barton Street to service Parcel A using existing rights-of-way.

This alternative reflects the extension of existing watermains on South Service Road and Sonoma Lane to service undeveloped lands as anticipated when the water system was originally designed. The connection to the existing watermain on Barton Street provides looping for the system servicing Parcel A.

This alternative also permits the connection to the existing 400 mm diameter watermain at the intersection of Fifty Road and South Service Road, constructed in 2007 (refer to Figure 4.1). A 200 mm diameter watermain stub was provided as part of the 2007 construction to service the proposed development. The area east of the 400 mm diameter watermain can be serviced by a 200 mm diameter watermain with a new cut-in tee connection to the existing watermain.

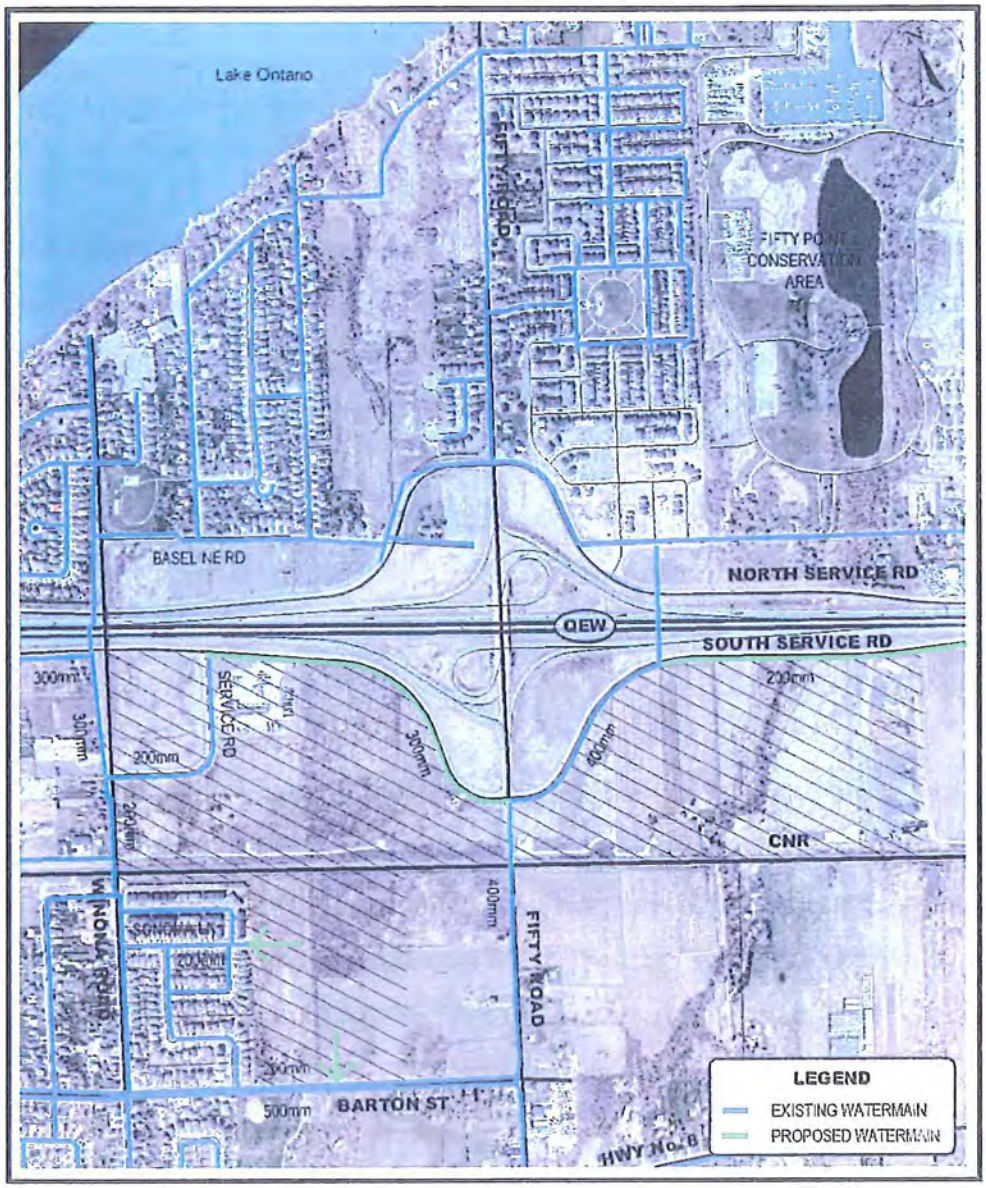


Figure 4.1 - Water - Alternative Solution No. 1

4.1.2 Alternative 2 - Water

Water servicing for Parcel B east of Fifty Road is via a watermain on the South Service Road extending from the new 400 mm diameter watermain for Parcel B west of Fifty Road. Servicing is from the new 400 mm diameter watermain on Fifty Road and through a new connection from the existing watermain on Winona Road through an easement adjacent to the CNR corridor.

For Parcel A, water servicing is via a new watermain extending westerly from Fifty Road through an easement and a new connection to the trunk watermain on Barton Street (refer to Figure 4.2).

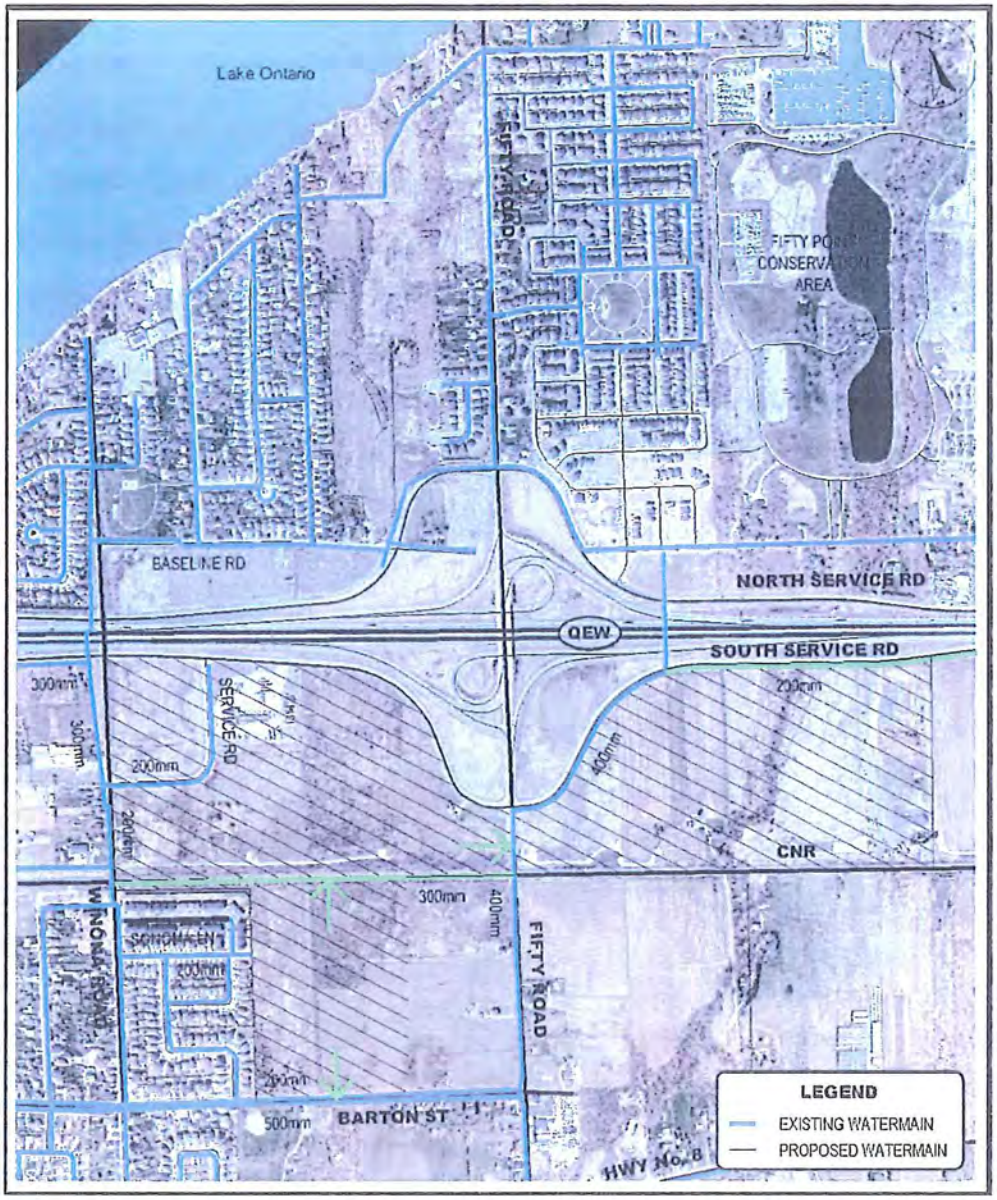


Figure 4.2 - Water - Alternative Solution No. 2

4.1.3 Alternative 3 - Water

This alternative is consistent with Alternatives 1 and 2 for Parcel B east of Fifty Road. For Parcel B west of Fifty Road, the existing watermain on the Service Road access loop is used to service the lands through an easement. Parcel A is serviced from a new connection on Winona Road, extending easterly through an easement adjacent to the CNR corridor and a new connection to the trunk watermain on Barton Street (refer to Figure 4.3).

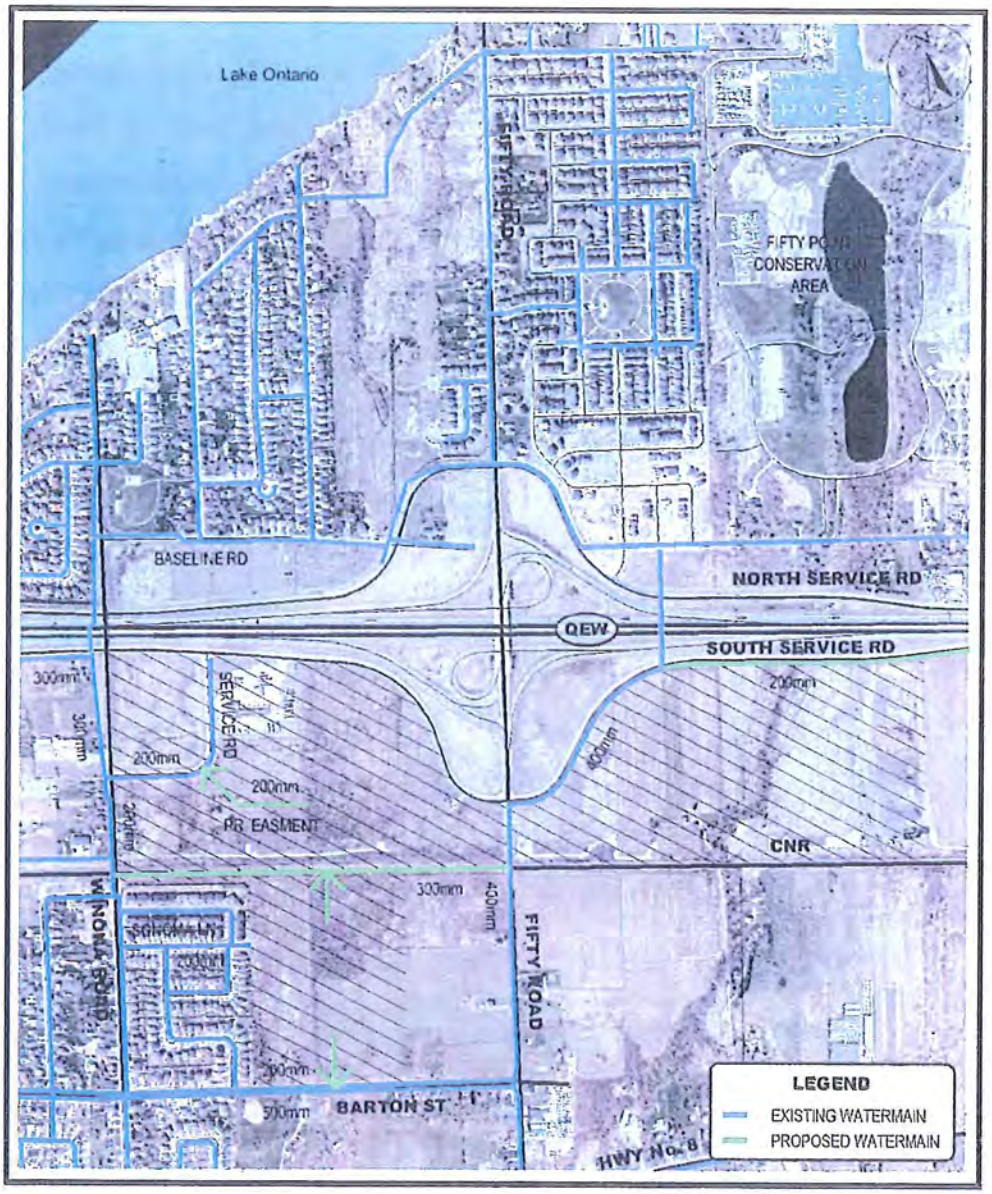


Figure 4.3 - Water - Alternative Solution No. 3

4.2 Wastewater Collection System

In Section 3.0, the available wastewater mains are identified. There is currently no wastewater main within Parcel A or Parcel B, however, extension of services had been considered in the Water and Wastewater Master Plans and are accessible to service the area. Three alternative servicing solutions were identified for SCUBE-East.

4.2.1 Alternative 1 - Wastewater

The primary trunk connection identified within the Water and Wastewater Master Plan is an existing 1200 mm diameter sewer on the South Service Road, west of Oriole Avenue. Alternative 1 is the connection of a new sewer on the South Service Road extending from west of Oriole Avenue to the Grimsby boundary to service Parcel B. The servicing of Parcel A is through the extension of the sewer on Sonoma Lane, and a connection to the existing sewer on Barton Street (refer to Figure 4.4).

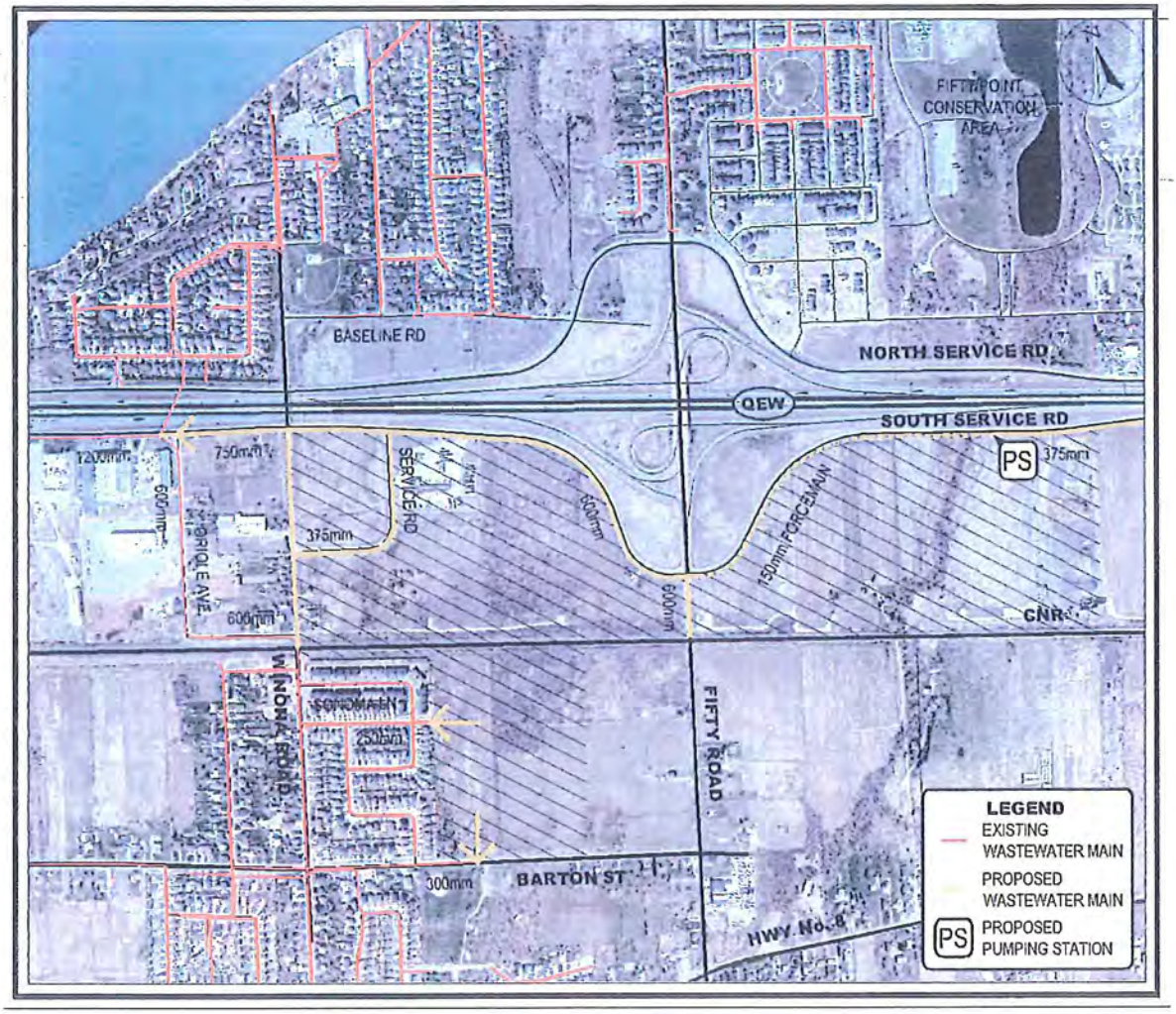


Figure 4.4 - Wastewater - Alternative Solution No. 1

4.2.2 Alternative 2 - Wastewater

Alternative 2 is to provide wastewater servicing through the extension of the South Service Road sewer to Winona Road, southerly on Winona Road to an easement adjacent to the CNR corridor. A new wastewater main would be constructed within an easement from Winona Road to the Grimsby boundary. This sewer would service both Parcels A and B. An additional connection would be required to the existing sewer on Barton Street to service the south portion of Parcel A (refer to Figure 4.5).

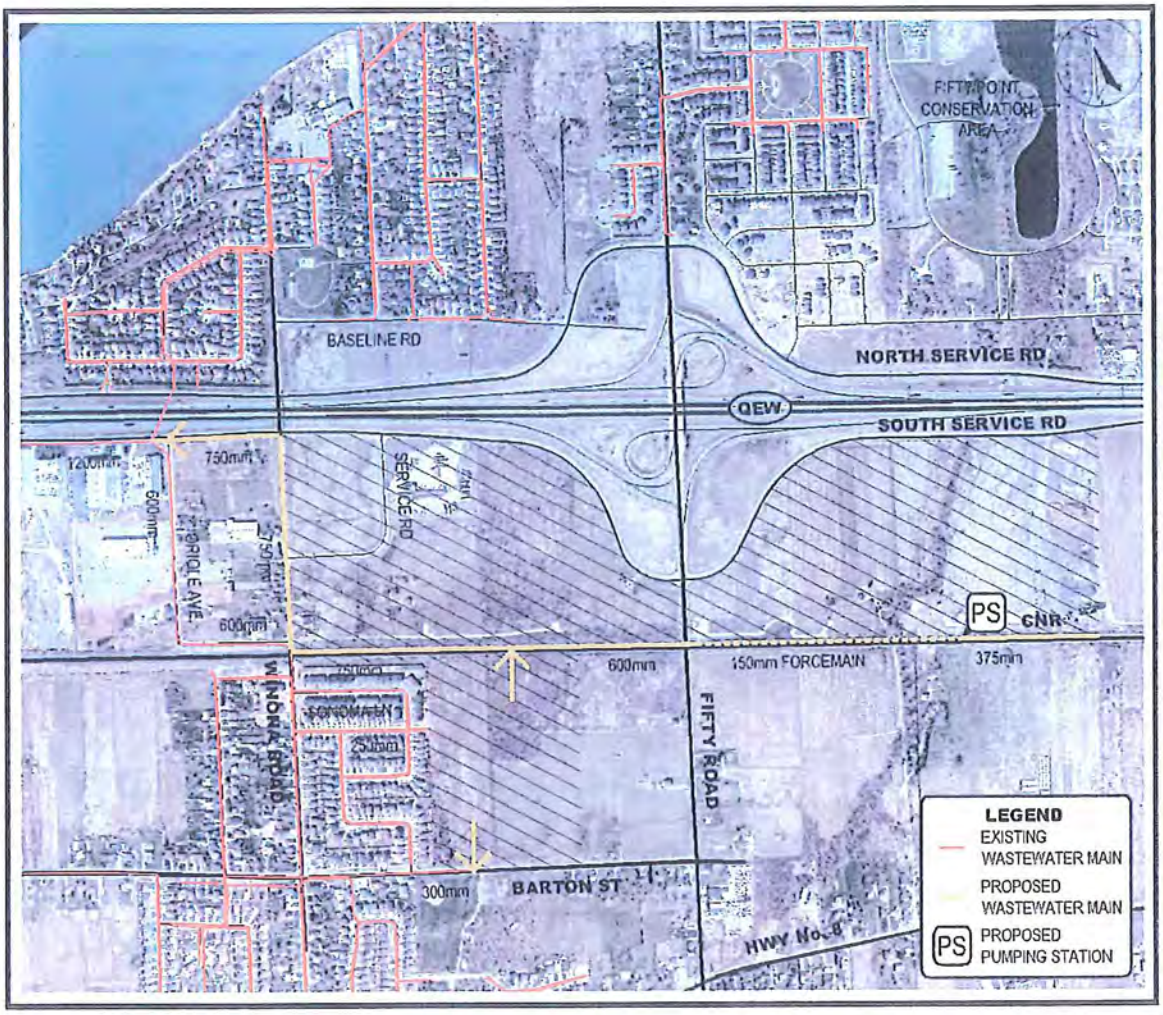


Figure 4.5 - Wastewater - Alternative Solution No. 2

4.2.3 Alternative 3 - Wastewater

Servicing under Alternative 3 requires the extension of the wastewater main west of Oriole Avenue to Fifty Road to service the westerly section of Parcel B. Parcel B east of Fifty Road would be serviced through an easement adjacent to the CNR corridor, east to the Grimsby boundary. Parcel A would be serviced using a sewer extending westerly from Fifty Road, within an easement adjacent to the CNR corridor (refer to Figure 4.6).

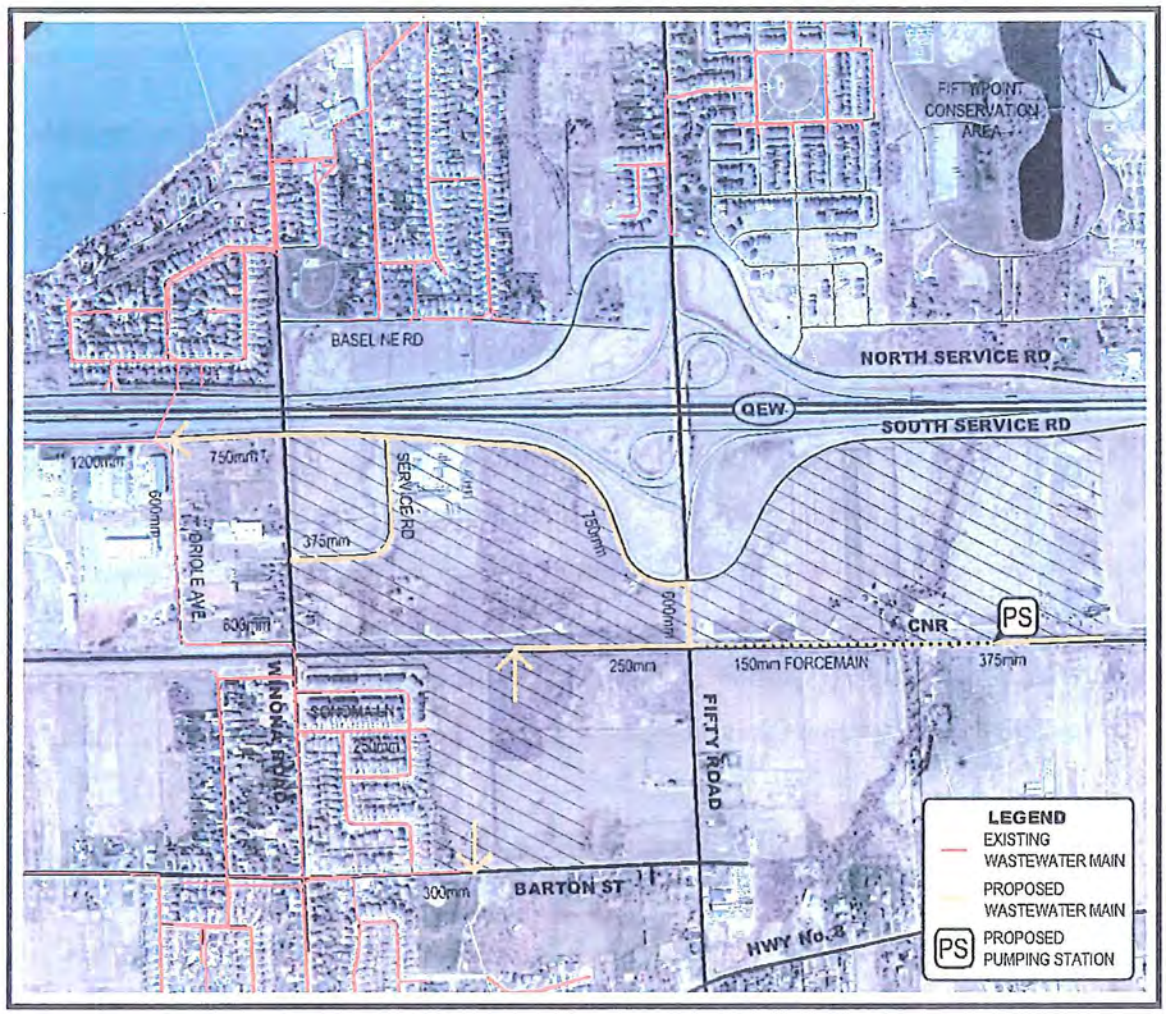


Figure 4.6: Wastewater - Alternative Solution No. 3

4.2.4 Pumping Station and Forcemain

Given the elevation difference between the existing invert elevation of the 1200 mm diameter sanitary sewer west of Oriole Avenue and the Fifty Creek stream bed, all of the alternatives for wastewater servicing include a pumping station and forcemain to service the extreme eastern portion of the SCUBE – East lands. Initial studies had suggested that the pumping station would be required west of Fifty Creek; however, additional investigation has suggested that the pumping station is only required to service lands east of Fifty Creek and can be located east of Fifty Mile Creek. This location will provide for a smaller area to be serviced by the pumping station allowing for a smaller pumping station to be constructed. Additionally, a pumping station in this location will allow for the forcemain (rather than gravity sewer) to run under the creek, and therefore, allow for a shallower wet well. The exact location of the pumping station has not been determined as there is insufficient information related to the elevations of the servicing corridors. This will be determined during the preliminary design of the sewers for the area.

4.3 Land External to Parcels A and B

Currently, lands south of Parcels A and B to the Niagara Escarpment are included in the Provincial Greenbelt and are not included within the SCUBE-East service area. These lands had been identified previously as potential development lands and therefore the Study considered additional development to the south in all servicing alternatives. A preliminary review of the area topography showed that additional development to the south can be serviced by gravity sewers. The water and wastewater servicing includes the appropriate pipe sizing to address this situation. Should the designation of these lands change, a review of the servicing options should be undertaken as the Municipal Class EA process has not been satisfied within the current project.

4.4 East Sanitary Interceptor (ESI)

Historically, the City has concerns related to the operation of the wet well at the Woodward Avenue WWTP due to the impact wet weather flows and future development have had on the

operation. The City has initiated upgrades at the Woodward Avenue WWTP; however, this work will be completed over several years. Since all the servicing alternatives for SCUBE-East rely on the East Sanitary Interceptor as the wastewater outlet, an assessment of the impact SCUBE-East has on the operation of the wet well is required and has been undertaken as part of the Study. The assessment of the ESI is provided in Section 5.0.

5.0 EVALUATION OF ALTERNATIVES

5.1 Evaluation Factors and Criteria

The Municipal Class EA process prescribes, in general terms, the factors which are to be used in the evaluation of servicing alternatives. These evaluation criteria include:

1. Functional - the ability of an alternative to address the problem/opportunity.
2. Environmental - the impact an alternative will have on the terrestrial and aquatic environment.
3. Social - the impact an alternative has on the ability to develop new or existing lands.
4. Economic - what are the relative capital and operational costs for the servicing alternatives.

The above factors were utilized for the evaluation of the three (3) Water Servicing Alternatives and the three (3) Wastewater Servicing Alternatives. These factors are also consistent with the City's "Triple Bottom Line" (TBL) evaluation criteria. The summary of the evaluation is provided in Tables 5.1 and 5.2.

5.1.1 Evaluation of Water Servicing Alternatives

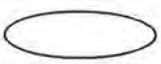
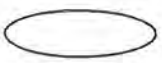
In relative terms, Alternatives 1, 2 and 3 address the Functional Effectiveness equally as each alternative provides services to the SCUBE-East lands equally.

Lands included within SCUBE-East are generally unused and the site is generally cleared. The only significant environmental constraint is Fifty Creek. Alternatives 1, 2 and 3 will require crossing of the creek using trenchless technology and therefore are rated equal in the assessment of the Environmental impact.

The water servicing proposed addresses the need to provide water service to the SCUBE-East lands to permit the development of the area. Therefore, from a Social perspective, Alternatives 1, 2 and 3 are equal.

From an Economic perspective, we consider both the Capital and Operational costs. The Capital Costs (refer to Table 5.3) for Alternative 1 are a net positive, in comparison to Alternatives 2 and 3. Alternative 1 is the extension of services which currently exist adjacent to and within SCUBE-East and therefore are a lower cost. Also, Alternative 1 will not require an easement (and the associated costs) while both Alternatives 2 and 3 will require an easement. Alternative 2 is the second low cost option. Operational Costs are considered to be approximately equal, however, Alternative 1 is considered as net positive when compared to Alternative 2 and 3 as all works are proposed for existing municipal rights-of-way. This will ensure reasonable access to all water servicing at all times. Alternatives 2 and 3 include watermain construction on easements which may result in restricted access from time to time.

Table 5.1 – Evaluation of Alternative Solutions – Water

Evaluation Category	Evaluation Criteria	Alternative Solution No. 1	Alternative Solution No. 2	Alternative Solution No. 3
Functional Effectiveness	Effectiveness			
Environmental	Terrestrial and Aquatic			
Social	Development Constraints / Opportunity			
Economic	Capital Cost			
	Operational Cost			
Alternative Ranking		1	3	2

Positive Neutral-Positive Neutral Negative-Neutral Negative

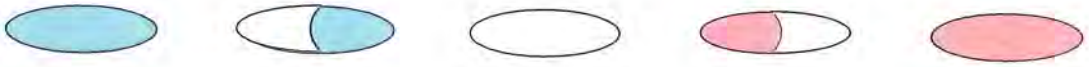


Table 5.2 Costs - Alternative Solutions – Water

Alternative Solution	Cost
1	0.68 M
2	0.73 M
3	0.83 M

5.1.2 Wastewater Servicing Alternatives

The evaluation of wastewater servicing alternatives was performed in a similar manner to the water system. Alternatives 1, 2 and 3 address the Functional Effectiveness equally as each alternative provides services to the SCUBE-East lands equally.

Lands included within SCUBE-East are generally unused and the site is generally cleared. The only significant environmental constraint is Fifty Creek. Alternatives 1, 2 and 3 will require

crossing of the creek using trenchless technology and therefore are rated equal in the assessment of the Environmental impact.

The wastewater servicing proposed addresses the need to provide wastewater service to the SCUBE-East lands to permit the development of the area. Therefore, from a Social perspective, Alternatives 1, 2 and 3 are equal.

From an Economic perspective, we consider both the Capital and Operational costs. The Capital Costs for Alternative 1 are a net positive, in comparison to Alternatives 2 and 3. Alternative 1 is the extension of services which currently exist adjacent to and within SCUBE-East and therefore are a lower cost. Alternative 2 is the second low cost option. Operational Costs are considered to be approximately equal, however, Alternative 1 is considered as net positive when compared to Alternative 2 and 3 as all works are proposed for existing municipal rights-of-way. This will ensure reasonable access to all wastewater servicing at all times. Alternatives 2 and 3 include wastewatermain construction on easements which may result in restricted access from time to time. Alternative solutions costs are summarized in Table 5.4.

5.1.3 Preferred Wastewater Servicing Alternative

Subsequent to the public consultation phase, additional investigation of the preferred wastewater servicing alternative was undertaken focused on construction feasibility. It was determined that construction of a sewer along Winona Road north to the South Service Road may require an easement near the base of the ramp. The servicing alternative was modified as shown in Figure 5.1. The sewer along Winona Road is to be extended to approximately 250 m north of Victoria Avenue and the sewer along the Service Road is to drain to the proposed South Service Road sewer. This modification will comply with the principles of the design of the preferred wastewater servicing alternative.

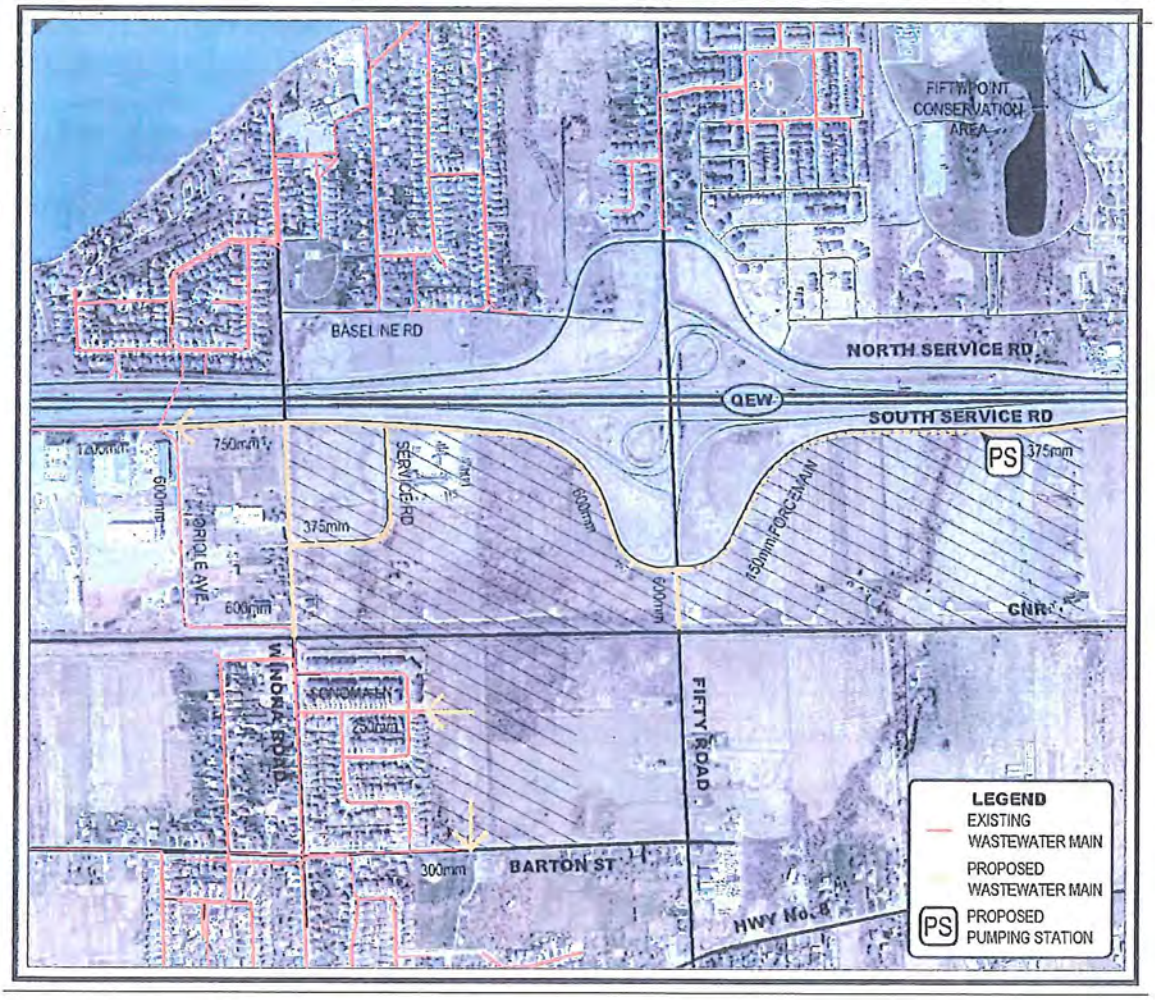
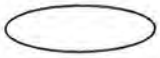
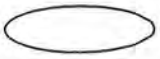


Figure 5.1: Preferred Wastewater Servicing Alternative

Table 5.3 – Evaluation of Alternative Solutions – Wastewater

Evaluation Category	Evaluation Criteria	Alternative Solution No. 1	Alternative Solution No. 2	Alternative Solution No. 3
Functional Effectiveness	Effectiveness			
Environmental	Terrestrial and Aquatic			
Social	Development Constraints / Opportunity			
Economic	Capital Cost			
	Operational Cost			
Alternative Ranking		1	2	2

Positive Neutral-Positive Neutral Negative-Neutral Negative

Table 5.4 Costs - Alternative Solutions – Wastewater

Alternative Solution	Cost ($)
1	2.05 M
2	2.01 M
3	2.21 M

6.0 TECHNICAL ANALYSIS

The Water and Wastewater Servicing is being undertaken in advance of the Secondary Plan for the SCUBE area. As such, the development densities for the proposed community use lands (Parcel 'A') and the employment lands (Parcel 'B') have not been adopted by Council. In order for the Study to move forward, conservative development densities are required to determine the servicing requirements for SCUBE-East and to assess the impact on existing infrastructure. To that end, conservative employment and development densities were generated based on the City of Hamilton Report "General Land Use Concept, Stoney Creek Special Policy Area F (November 2006) and in consultation with City Planning Staff. The employment and development densities are summarized as follows:

Parcel 'A' - Community Use
- Density Range – 57 to 98 persons per hectare

Parcel 'B' - Employment Lands
- Employment Range – 34 to 79 jobs per hectare

The upper limit (worst case) has been used in the water and wastewater analysis for SCUBE-East for Parcels 'A' and 'B'.

6.1 Water Distribution System

6.1.1 Water System Description

The water distribution analysis was undertaken using information provided by the City of Hamilton, developed as part of the City's Master Plan and GRIDS processes. Works to service the Stoney Creek area as well as reinforce water supply north of the QEW through a 400 mm diameter crossing within the SCUBE-East area were identified.

The watermain servicing for the area is outlined in Figure 2.1, the SCUBE-East lands, and the demands associated with the system are in Table 6.1.

Table 6.1 - SCUBE East Water Demands

Criteria	Value	Area	Density Range		Demand	
Average Day Residential Consumption	360 Lpcd	153.73 ha	57	98 ppha	3.15 ML/d	5.42 ML/d
Average Day Employment Consumption	260 L/employee/d	62.88 ha	34	79 jobs/ha	0.56 ML/d	1.29 ML/d

6.1.2 Results

The water model, WaterCAD, was used to assess two key factors which determine the performance of a water distribution system; system pressure and pipe velocity. The minimum operating pressure should not be less than 40 psi during peak hour demands and 20 psi during fire flow events. The modeled system pressures for current year, 2021 and 2031 (ultimate conditions) are presented in Tables 6.1, 6.2 and 6.3, respectively.

Table 6.2 - Current Year (Existing) Modeling Results

Model Node	Avg. Day Node Pressure	Max. Day Node Pressure	Peak Hour Node Pressure	Available Fire Flow
J-555 (Residential)	62.2 psi	58.7 psi	54.4 psi	> 85 L/s
J-553 (Commercial)	69.9 psi	66.7 psi	61.4 psi	> 205 L/s
J-554 (Commercial)	69.9 psi	66.7 psi	61.4 psi	> 205 L/s
J-556 (Residential)	59.1 psi	55.3 psi	50.5 psi	> 85 L/s
J-551 (Commercial)	72.7 psi	69.0 psi	64.3 psi	180 L/s (V>9.0 ft/s in 200mm)
Max. Pipe Velocity in Area	< 0.46 m/s (< 1.5 ft/s)	< 0.61 m/s (<2.0 ft/s)	< 0.91 m/s (< 3.0 ft/s)	< 2.44 m/s (<8.0 ft/s)

Note: Results based on two (2) High Lift Pumps operated at the Woodward Ave WWTP

Table 6.3 – 2021 Development Year Modeling Results

Model Node	Avg. Day Node Pressure	Max. Day Node Pressure	Peak Hour Node Pressure	Available Fire Flow
J-555 (Residential)	61.5 psi	59.0 psi	51.4 psi	> 85 L/s
J-553 (Commercial)	69.2 psi	66.4 psi	58.2 psi	> 205 L/s
J-554 (Commercial)	69.2 psi	66.4 psi	58.2 psi	> 205 L/s
J-556 (Residential)	58.4 psi	55.6 psi	47.3 psi	> 85 L/s
J-551 (Commercial)	72.1 psi	69.2 psi	61.1 psi	180 L/s (V>9.0 ft/s in 200mm)
Max. Pipe Velocity in Area	< 0.46 m/s (< 1.5 ft/s)	< 0.61 m/s (<2.0 ft/s)	< 0.91 m/s (< 3.0 ft/s)	< 2.44 m/s (<8.0 ft/s)

Note: Results based on two (2) High Lift Pumps operated at the Woodward Ave WTP for Average Day and three (3) High Lift Pumps for Maximum Day and Peak Hour.

Table 6.4 – 2031 Development Year (Ultimate) Modeling Results

Model Node	Avg. Day Node Pressure	Max. Day Node Pressure	Peak Hour Node Pressure	Available Fire Flow
J-555 (Residential)	61.0 psi	57.6 psi	50.7 psi	> 85 L/s
J-553 (Commercial)	68.7 psi	64.9 psi	57.5 psi	> 205 L/s
J-554 (Commercial)	68.7 psi	64.9 psi	57.5 psi	> 205 L/s
J-556 (Residential)	57.9 psi	54.0 psi	46.5 psi	> 85 L/s
J-551 (Commercial)	71.5 psi	67.7 psi	60.3 psi	175 L/s (V>9.0 ft/s in 200mm)
Max. Pipe Velocity in Area	< 0.46 m/s (< 1.5 ft/s)	< 0.61 m/s (<2.0 ft/s)	< 0.91 m/s (< 3.0 ft/s)	< 2.44 m/s (<8.0 ft/s)

Note: Results based on three (3) High Lift Pumps operated at the Woodward Ave WTP.

The maximum pipe velocity is targeted at 2.74 m/s. Based on the analysis, the maximum velocity does not exceed the target under all conditions. The detailed analysis is provided in Appendix B.

Based on the water distribution system analysis, the proposed watermain improvements identified as Alternative 1 are sufficient to meet the anticipated demands for SCUBE-East.

6.2 Wastewater Collection System

6.2.1 Wastewater System Description

The preferred wastewater collection system, Alternative 1, consists of the extension of the trunk sewer along the South Service Road from west of Oriole Avenue to the Grimsby boundary, including a pumping station and forcemain to service lands east of Fifty Creek, the extension of the Sonoma Lane sewer and connection to the existing sewer on Barton Street. Information on the system was provided by the City of Hamilton from the Water and Wastewater Master Plan. The modeling was undertaken using MOUSE. In addition to modeling of the SCUBE-East area, the City requested an evaluation of the impact development of the SCUBE-East lands would have on the operation of the wet well at the Woodward WWTP. The City is proposing significant expansion to the facilities at Woodward Avenue WWTP, however, this work will proceed over several years and the City required a demonstration that there will be no detrimental impact on the wet well operation over the interim period.

6.2.2 Results

Table 6.4 is the Sanitary Sewer Design Sheet for servicing required for SCUBE-East and summarizes anticipated sanitary sewer flows for the area. The design criteria is based on the City of Hamilton Standards and Specifications. This information was used as an input to the MOUSE model for evaluation of the East Sanitary Interceptor. Several scenarios were run in the assessment of the ESI, and the results of the evaluation are provided in Appendix B. Table 6.5 summarizes the results from the MOUSE analysis. The analysis confirms the ESI has sufficient capacity to accommodate the development of SCUBE-East. The impact of the wet well and the ESI under the worst condition, i.e. modeling the impact of the 5 year return storm with the inclusion of maximum wastewater flows from SCUBE-East results in 43.8% spare capacity in the East Interceptor Sewer.

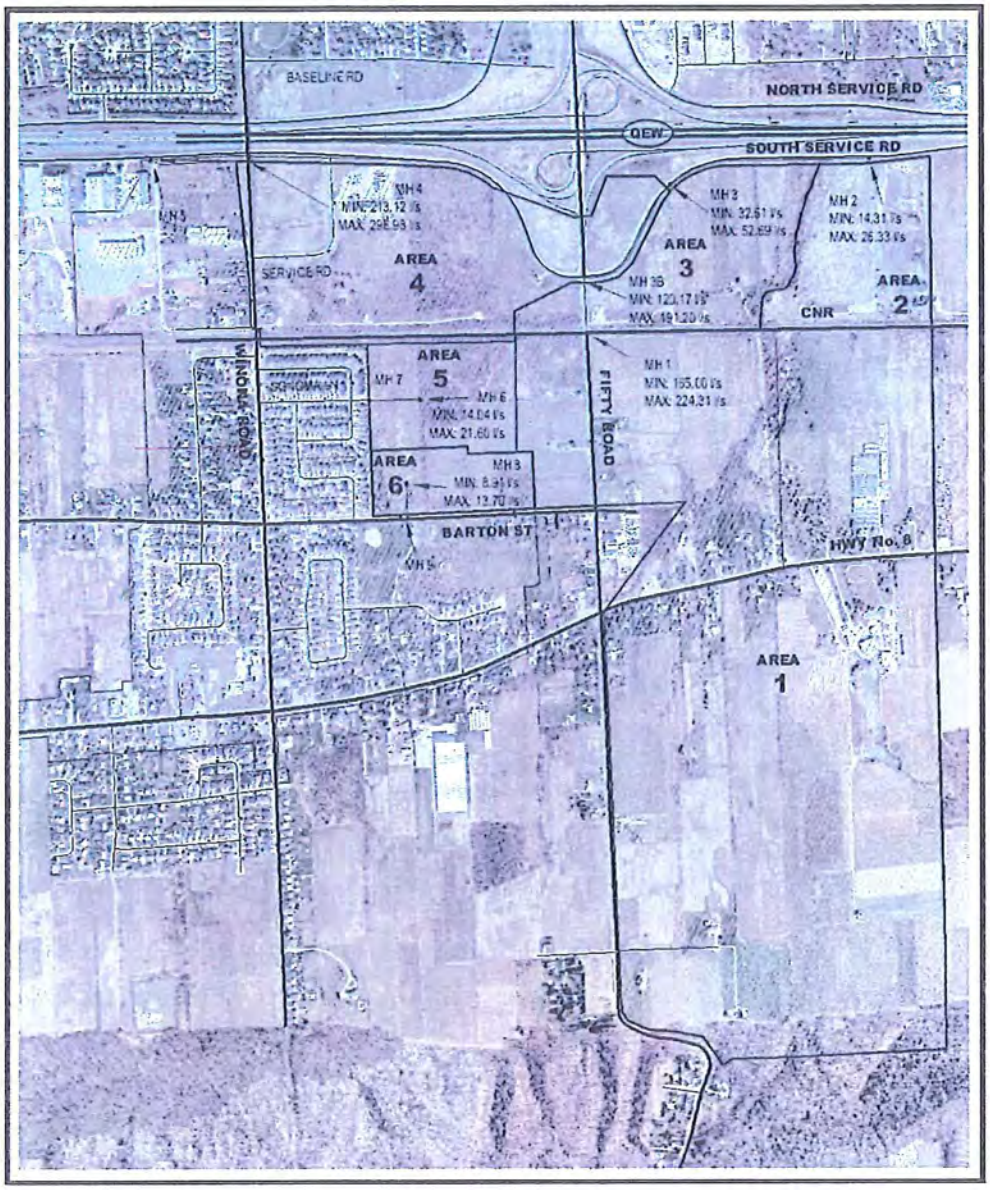


Figure 6.1: Sanitary Sewer Catchment Areas

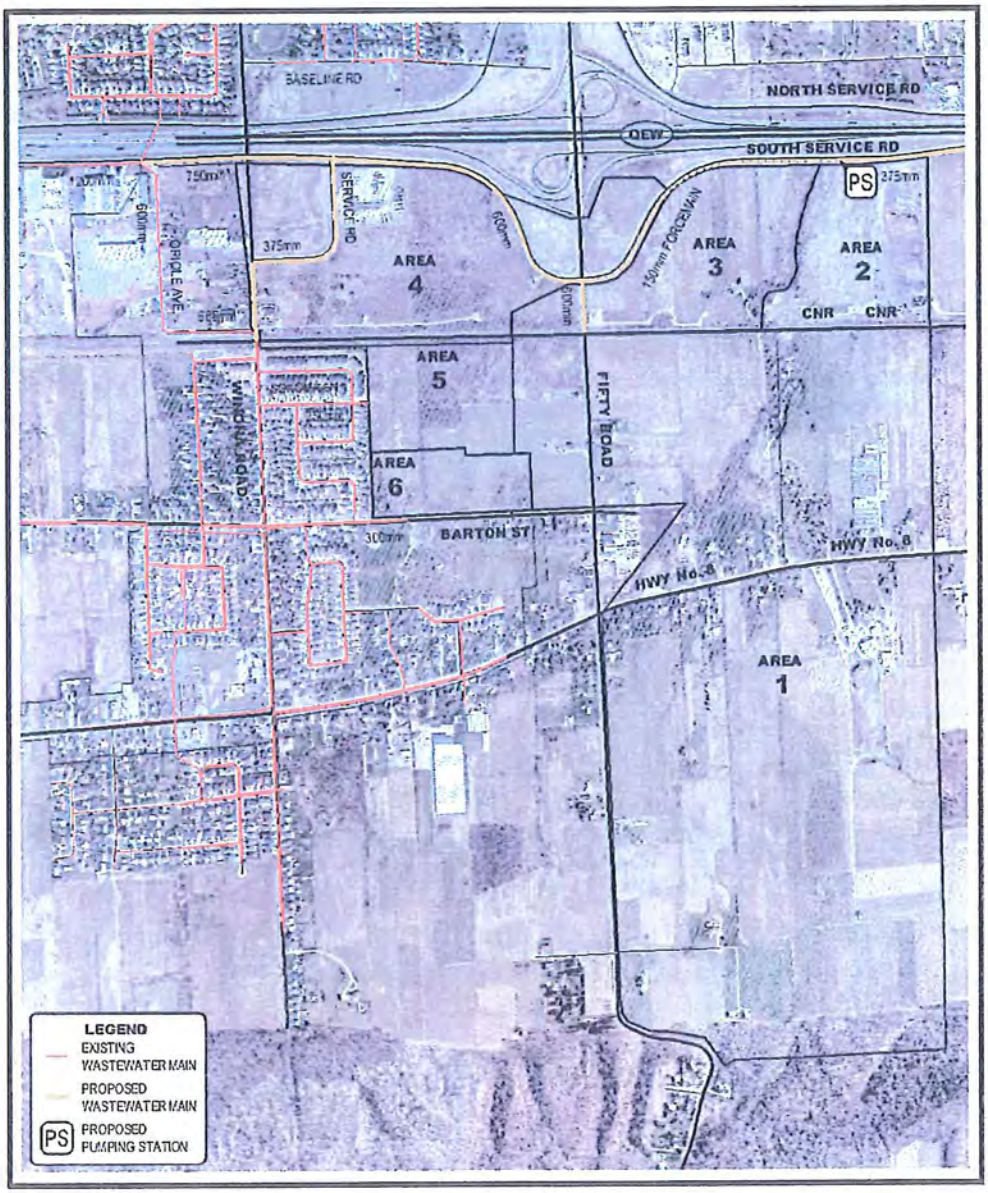


Figure 6.2: Sanitary Sewer Catchment Areas with Preferred Alternative

Table 6.3 - Sanitary Sewer Design Calculations for Minimum Population Density

CITY OF HAMILTON

Sanitary Sewer Design

Location: SCUBE - East
Checked By:
Date:

Flow Factor: 360 l/day/cap
Peaking Factor: 5*(P^-0.2)
Infiltration: 0.4 0.2 l/s/ha for the City of Hamilton
0.4 l/s/ha for area Municipalities

Area No.	Street Name	From MH	To MH	Pop. Density (ppha)	Area (ha)	Cumm. Area (ha)	Pop.	Cumm. Pop	Sanitary Flow				Total Flow (l/s)	SEWER DESIGN							
									Peak Factor	Q_{Avg} (l/s)	Q_{Peak} (l/s)	Infilt (l/s)		Dia. (mm)	Type	Grade (%)	Mann. n	Vel. (m/s)	Q_{Full} (l/s)	% Flow	% Vel.	Actual Vel. (m/s)
1		1	3B	57	139.28	139.28	7939	7939	3.30	33.08	109.29	55.71	165.00	600		0.30	0.013	1.2021	350.85	47%	98%	1.1781
2		2	3	34	12.91	12.91	439	439	5.00	1.83	9.14	5.16	14.31	375		0.40	0.015	0.8794	100.26	14%	76%	0.6683
3		3	3B	34	16.52	29.43	562	1001	5.00	4.17	20.84	11.77	32.61	375		0.30	0.015	0.7616	86.827	38%	94%	0.7159
		3B	4	34	0.00	168.71	0	8939	3.23	37.25	120.17	67.48	187.65	600		0.30	0.013	1.2021	350.85	53%	103%	1.2382
4		4	5	34	33.45	202.16	1137	10077	3.15	41.99	132.26	80.86	213.12	750		0.30	0.013	1.3949	636.13	34%	91%	1.2694
5		6	7	57	8.84	8.84	504	504	5.00	2.10	10.50	3.54	14.04	250		0.60	0.015	0.8219	41.648	34%	91%	0.7480
6		8	9	57	5.61	5.61	320	320	5.00	1.33	6.66	2.24	8.91	250		0.70	0.015	0.8878	44.985	20%	80%	0.7102

Table 6.4 - Sanitary Sewer Design Calculations for Maximum Population Density

CITY OF HAMILTON

Sanitary Sewer Design

Location: SCUBE - East
Checked By:
Date:

Flow Factor: 360 l/day/cap
Peaking Factor: 5*(P^-0.2)
Infiltration: 0.4 0.2 l/s/ha for the City of Hamilton
0.4 l/s/ha for area Municipalities

Area No.	Street Name	From MH	To MH	Pop. Density (ppha)	Area (ha)	Cumm. Area (ha)	Pop.	Cumm. Pop	Sanitary Flow				Total Flow (l/s)	SEWER DESIGN								
									Peak Factor	Q_{Avg} (l/s)	Q_{Peak} (l/s)	Infilt (l/s)		Dia. (mm)	Type	Grade (%)	Mann. n	Vel. (m/s)	Q_{Full} (l/s)	% Flow	% Vel.	Actual Vel. (m/s)
1		1	3B	98	139.28	139.28	13649	13649	2.96	56.87	168.59	55.71	224.31	600		0.30	0.013	1.2021	350.85	64%	107%	1.2862
2		2	3	79	12.91	12.91	1020	1020	4.98	4.25	21.16	5.16	26.33	375		0.40	0.015	0.8794	100.26	26%	85%	0.7475
3		3	3B	79	16.52	29.43	1305	2325	4.22	9.69	40.91	11.77	52.69	375		0.30	0.015	0.7616	86.827	61%	105%	0.7997
		3B	4	79	0.00	168.71	0	15974	2.87	66.56	191.20	67.48	258.68	600		0.30	0.013	1.2021	350.85	74%	110%	1.3223
4		4	5	79	33.45	202.16	2643	18617	2.79	77.57	216.11	80.86	296.98	750		0.30	0.013	1.3949	636.13	47%	99%	1.3810
5		6	7	98	8.84	8.84	867	867	5.00	3.61	18.06	3.54	21.60	250		0.60	0.015	0.8219	41.648	52%	102%	0.8384
6		8	9	98	5.61	5.61	550	550	5.00	2.29	11.46	2.24	13.70	250		0.70	0.015	0.8878	44.985	30%	89%	0.7901

Table 6.5 - Wastewater Collection System Modeling Results

Flow Scenario	Description of Flow Scenario	Maximum Flow from SCUBE East Area (L/s)	Hydraulic Capacity of ESI at MH SM03A001 (L/s)	Spare Capacity of ESI at MH SM03A001 (L/s)	Maximum Extent of Backwater from Wet Well
#1	Maximum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for DWF conditions, with a wet well level of 66m	490	1,233	60.3%	to MH HR06A008, near downstream end of ESI, approx. 1,035 m u/s of WWTP
#2	Minimum Peak Sanitary Flow from SCUBE East (from Table 3-2) plus 2031 sanitary flows for remaining drainage areas, for DWF conditions, with a wet well level of 66m	363	1,233	70.6%	to MH HR06A008, near downstream end of ESI, approx. 1,035 m u/s of WWTP
#3	Maximum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for 5-year storm, with a wet well level of 66m	44	1,233	47.8%	to MH HR06A008, near downstream end of ESI, approx. 1,035 m u/s of WWTP
#4	Minimum Peak Sanitary Flow from SCUBE East (from Table 3-2) plus 2031 sanitary flows for remaining drainage areas, for 5-year storm, with a wet well level of 66m	516	1,233	58.2%	to MH HR06A008, near downstream end of ESI, approx. 1,035 m u/s of WWTP
#5	Maximum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for Dec 1, 2006 storm event, using actual time series of observed wet well levels (max level = 72.56m)	615	1,233	50.1%	to MH SK03A002, approx. 1,600 m d/s of SCUBE East inflow to ESI
#6	Minimum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for Dec 1, 2006 storm event, using actual time series of observed wet well levels (max level = 72.56m)	488	1,233	60.4%	to MH SK03A002, approx. 1,600 m d/s of SCUBE East inflow to ESI

7.0 CONCLUSIONS AND RECOMMENDATIONS

The Water and Wastewater Servicing Master Plan has been initiated to address the requirements of the Municipal Class EA. For Master Plan, proponents required to completed Phases 1 and 2 of the process, including problem/opportunity statement, identification and assessment of alternatives and Public Consultation. The study report provides a summary of the Municipal Class EA process used and Public Consultation for the Study.

The Study findings include:

1. For extension of the water distribution system, Alternative Solution No. 1 was selected as the preferred alternative.

2. For extension of the wastewater collection system, Alternative Solution No. 1 was selected as the preferred alternative.

3. The preferred alternatives for water distribution and wastewater collection services are essentially extensions of the existing infrastructure services adjacent to or within the Study area.

4. The Technical Assessment undertaken based on the preferred alternative indicates that the water distribution system for SCUBE-East will have no detrimental impact on the existing system. In addition, the preferred alternative meets or exceeds City of Hamilton design requirements.

5. The Technical Assessment undertaken based on the preferred alternative indicates that the wastewater collection system for SCUBE-East will have no detrimental impact on the existing system. Further, the analysis of the East Sanitary Interceptor and the wet well at the Woodward Avenue WWTP indicate that the development in SCUBE-East will have minimal impact on the trunk system and no impact on the

operation of the wet well. Finally, the preferred alternative meets or exceeds the City of Hamilton design requirements for the ultimate development of SCUBE–East.

6. A wastewater pumping station and forcemain shall be required to service lands east of Fifty Creek.

Project	Schedule	Additional Work Required
Water Distribution System		
Extension of the watermain on the South Service Road from Winona Road, easterly to the Town of Grimsby boundary, to service Parcel B using existing rights-of-way.	**Schedule A+** - Establish, extend or enlarge a water distribution system and all necessary works to connect this system to an existing system or water source, provided all such facilities are in either and existing road allowances or an existing utility corridor, including the use of Trenchless Technology for water crossings.	The project is considered pre-approved but the public will have to be advised of the project prior to implementation The manner in which the public is to be advised is to be determined by the City. There is no ability for the public to request a Part II Order.
Extension of the watermain on Sonoma Lane easterly to service Parcel A using existing rights-of-way.	**Schedule A+** - Establish, extend or enlarge a water distribution system and all necessary works to connect this system to an existing system or water source, provided all such facilities are in either and existing road allowances or an existing utility corridor, including the use of Trenchless Technology for water crossings.	The project is considered pre-approved but the public will have to be advised of the project prior to implementation The manner in which the public is to be advised is to be determined by the City. There is no ability for the public to request a Part II Order.
A new connection to the trunk watermain on Barton Street to service Parcel A using existing rights-of-way.	**Schedule A+** - Establish, extend or enlarge a water distribution system and all necessary works to connect this system to an existing system or water source, provided all such facilities are in either and existing road allowances or an existing utility corridor, including the use of Trenchless Technology for water crossings.	The project is considered pre-approved but the public will have to be advised of the project prior to implementation The manner in which the public is to be advised is to be determined by the City. There is no ability for the public to request a Part II Order.
Wastewater Collection System		
A new sewer on the South Service Road extending from west of Oriole Avenue to the Grimsby boundary to service Parcel B using existing rights-of-way.	**Schedule A+** - Establish, extend or enlarge a sewage collection system and all necessary works to connect this system to an existing sewage or natural drainage outlet, provided all	The project is considered pre-approved but the public will have to be advised of the project prior to implementation The manner in which the public is to be advised is

	such facilities are in either and existing road allowances or an existing utility corridor, including the use of Trenchless Technology for water crossings.	to be determined by the City. There is no ability for the public to request a Part II Order.
Extension of the sewer on Sonoma Land to service Parcel A using existing rights-of-way.	**Schedule A+** - Establish, extend or enlarge a sewage collection system and all necessary works to connect this system to an existing sewage or natural drainage outlet, provided all such facilities are in either and existing road allowances or an existing utility corridor, including the use of Trenchless Technology for water crossings.	The project is considered pre-approved but the public will have to be advised of the project prior to implementation The manner in which the public is to be advised is to be determined by the City. There is no ability for the public to request a Part II Order.
The construction of a new pumping to service lands east of Fifty Mile Creek.	**Schedule B** - Construct new pumping station or increase pumping station capacity by adding or replacing equipment and appurtenances, where new equipment id location in a new building or structure.	The Master Plan process addressed Phase 1 and 2 of the Municipal Class Environmental Assessment process. Additional investigations will be carried out at a later date.

Based on the above, we recommend the Water and Wastewater Master Servicing Plan for SCUBE-East be approved.

APPENDIX A1

NOTICE OF STUDY COMMENCEMENT AND PIC NO. 1

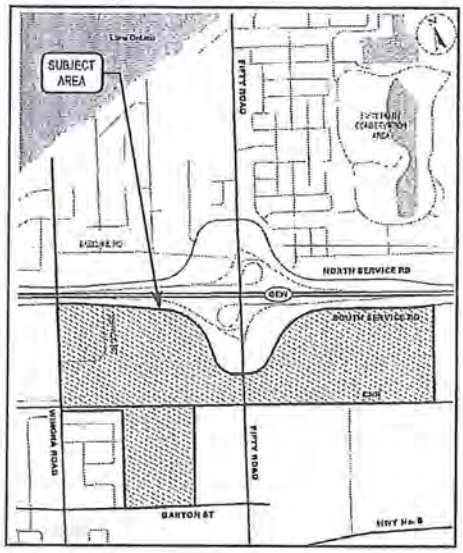
WATER AND WASTEWATER MASTER SERVICING PLAN FOR THE STONEY CREEK URBAN BOUNDARY EXPANSION – EAST

CLASS ENVIRONMENTAL ASSESSMENT NOTICE OF STUDY COMMENCEMENT AND PUBLIC INFORMATION CENTRE

Hamilton

THE STUDY

The City of Hamilton has initiated a Water and Wastewater Master Servicing Plan process for the Stoney Creek Urban Boundary Expansion – East lands (See attached location map). The City of Hamilton is in the process of preparing a Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area. The Water and Wastewater Master Servicing Plan will become a component of the Secondary Plan. The preparation of the Water and Wastewater Master Servicing Plan will proceed ahead of the City's schedule for preparation of the SCUBE – East Secondary Plan.



THE PROCESS

This project is being planned under the planning and design process for Master Plan as defined in the Municipal Engineers Association's Municipal Class Environmental Assessment (June 2000).

The Class EA defines a Master Plan as:

"A Long range plan, integrating infrastructure requirements for present and future land use with environmental planning principles. The plan examines the whole infrastructure system in order to outline a framework for planning subsequent projects and/or developments (Class EA, 2000)."

This project will follow the Class Environmental Assessment process for Master Plans and will satisfy Phases 1 and 2 of the Class EA Process. As part of the process, public and agency consultation will be undertaken and detailed development and evaluation of alternative water and wastewater servicing strategies will be examined.

A second Public Information Centre will be held at a later date where the alternative solution for water and wastewater and details of the Master Servicing Plan will be provided. Upon completion of the study, the Master Servicing Plan will be available for public review and comment. Advertisements will be published at these times.

PUBLIC INFORMATION CENTRE 1

The Public Information Centre will be held to present:

- The problem and opportunity statement
- Review of background information and previous reports
- The preliminary results of the data collection and analysis
- Initial problem identification for water and wastewater

DATE: **Thursday, November 1st, 2007**
TIME: **6:00 p.m. to 8:00 p.m.**
LOCATION: **Stoney Creek Municipal Service Centre**
777 Highway 8, Stoney Creek

PUBLIC COMMENTS INVITED

There is an opportunity at any time during this process for interested persons to review outstanding issues and bring concerns to the attention of the Project Managers. If you have any questions or comments or wish to be added to the study mailing list, please contact:

Paul Smeltzer, P.Eng.
Project Manager
Philips Engineering Ltd.
3215 North Service Road,
Burlington, Ontario
L7R 3Y2
Ph. (905) 335-2353 ext. 1283
Fax (905) 335-1414
E-mail:psmeltzer@philipseng.com

Udo Ehrenberg P. Eng.
Project Manager, City of Hamilton
Box 220 Plant Capital and Planning
Public Works Department
55 John Street North, 6th Floor
Hamilton, ON L8R 3M8
Ph. (905) 546-2424 ext. 2499
Fax (905) 546-4491
E-mail: uehrenbe@hamilton.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act.* With the exception of personal information, all comments will become part of the public record.

This Notice issued on October 19th and 26th.

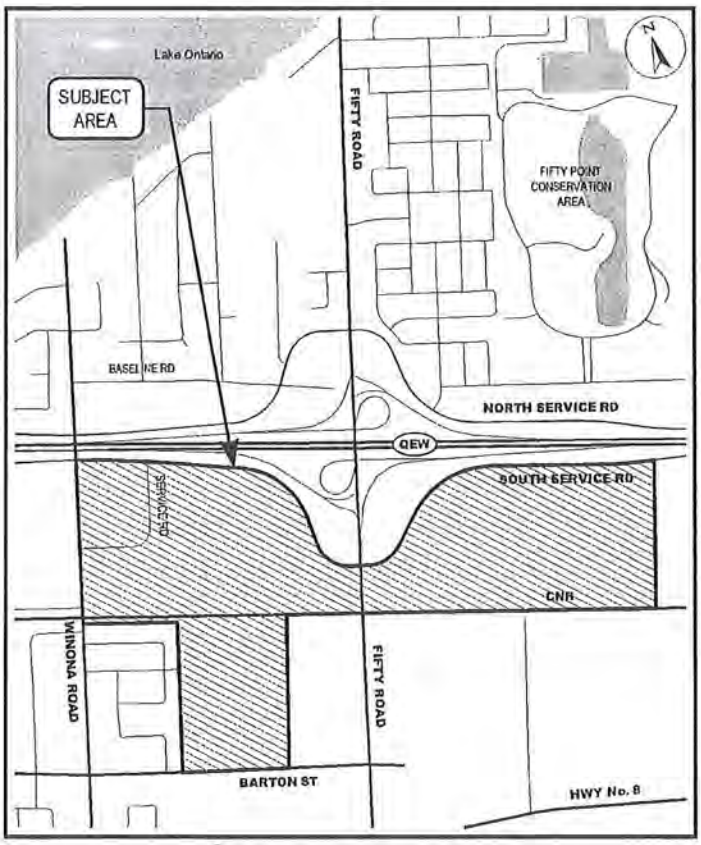
Hamilton

WATER AND WASTEWATER MASTER SERVICING PLAN FOR THE STONEY CREEK URBAN BOUNDARY EXPANSION – EAST

CLASS ENVIRONMENTAL ASSESSMENT NOTICE OF STUDY COMMENCEMENT AND PUBLIC INFORMATION CENTRE

THE STUDY

The City of Hamilton has initiated a Water and Wastewater Master Servicing Plan process for the Stoney Creek Urban Boundary Expansion – East lands (See attached location map). The City of Hamilton is in the process of preparing a Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area. The Water and Wastewater Master Servicing Plan will become a component of the Secondary Plan. The preparation of the Water and Wastewater Master Servicing Plan will proceed ahead of the City's schedule for preparation of the SCUBE – East Secondary Plan.



THE PROCESS

This project is being planned under the planning and design process for Master Plan as defined in the Municipal Engineers Association's *Municipal Class Environmental Assessment* (June 2000).

The Class EA defines a Master Plan as:

> "A Long range plan, integrating infrastructure requirements for present and future land use with environmental planning principles. The plan examines the whole infrastructure system in order to outline a framework for planning subsequent projects and/or developments (Class EA, 2000)."

This project will follow the Class Environmental Assessment process for Master Plans and will satisfy Phases 1 and 2 of the Class EA Process. As part of the process, public and agency consultation will be undertaken and detailed development and evaluation of alternative water and wastewater servicing strategies will be examined.

A second Public Information Centre will be held at a later date where the alternative solution for water and wastewater and details of the Master Servicing Plan will be provided. Upon completion of the study, the Master Servicing Plan will be available for public review and comment. Advertisements will be published at these times.

PUBLIC INFORMATION CENTRE 1

The Public Information Centre will be held to present:

- The problem and opportunity statement
- Review of background information and previous reports
- The preliminary results of the data collection and analysis
- Initial problem identification for water and wastewater

DATE: Thursday November 1, 2007
TIME: 6:00 p.m. to 8:00 p.m.
LOCATION: Stoney Creek Municipal Building, 777 Highway 8, Stoney Creek

PUBLIC COMMENTS INVITED

There is an opportunity at any time during this process for interested persons to review outstanding issues and bring concerns to the attention of the Project Managers. If you have any questions or comments or wish to be added to the study mailing list, please contact:

Paul Smeltzer, P.Eng.
Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington, Ontario
L7R 3Y2
Ph. 905-335-2353 ext. 1283
Fax 905-335-1414
E-mail psmeltzer@philipseng.com

Udo Ehrenberg, P. Eng.
Project Manager
City of Hamilton
Plant Capital and Planning
Public Works Department
55 John Street North, 6th Floor
Hamilton, ON L8R 3M8
Ph. (905) 546-2424 ext. 2499
Fax (905) 546-4491
E-mail uehrenbe@hamilton.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

This Notice issued on October 19th and 26th.

October 19, 2007
Our File: 107034-12

Indian and Northern Affairs Canada
P.O. Box 1960

Brantford, ON N3T 5W5

Dear :

RE: Notice of Study Commencement and
Public Information Centre
Water and Wastewater Master Servicing Plan
For the Stoney Creek Urban Boundary Expansion – East

The City of Hamilton has initiated a Water and Wastewater Master Servicing Plan process for the Stoney Creek Urban Boundary Expansion – East lands. The Water and Wastewater Master Servicing Plan will become a component of the Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area. The Notice of Study Commencement and Public Information Centre is attached.

The purpose of this letter is to introduce the project and to seek input on the environmental (natural, socio-economic or cultural) conditions or sensitivities within the study area and any issues or concerns that you may have.

If you have any questions, you may contact either the undersigned or one of the Project Managers named in the enclosed material.

Yours very truly,

PHILIPS ENGINEERING LTD.

Per: Paul D. Smeltzer, P. Eng.

HD/kf
Encl.
G:\Work\107034\Corr\Letter\NComm-PIC\NComm(Agency)October,07.doc

c.c. Mr. Udo Ehrenberg - City of Hamilton

Last Name	First Name	Address 1
OTHER MUNICIPALITIES		
Gilroy	Pam	Regional Municipality of Niagara
Langley	Carolyn	Township of West Lincoln
Neville	Ian	Regional Municipality of Niagara
Southall	Wendy	Niagara Regional Police Service
Vout	Katherine	Town of Grimsby
CONSERVATION AUTHORITY		
Menyes	**Kathy**	**Hamilton Conservation Authority**
PROVINCIAL AUTHORITIES		
Connolly	Gemma	Ministry of the Environment
Cunningham	Robert	Ministry of Agriculture and Food
Chrzan	Tom	Ministry of Citizenshiop & Immigration
Durst	Joad	Ministry of Natural Resources
Ferris	Neal	Ministry of Culture
Johnson	David	Niagara Escarpment Commission
McCarthy	Terry	Ministry of Community and Social Services
Ryter	Barbara	Ministry of the Environment
von Kursell	Sybelle	Municipal Affairs & Housing
Weeks	J. R.	Burlington Detachment
Whitbread	Ken	Niagara Escarpment Commission
Gill	Surinder Singh	Ontario Secretariat for Aboriginal Affairs
Stone	Michael	Ministry of Natural Resources
FRIST NATION'S CONTACT		
General	David M.	1695 Chiefswood Road
Elijah	Rolanda	387 Princess Avenue
Greene	Jo-Ann E.C.	
LaForme	Bryan	2789 Mississauga Road
Sault	Cecil	Mississaugas of New Credit First Nation
Utilities/Rail/Pipelines		
Ardelli	Terri	TransCanada Pipelines

Blakely	John	Enbridge Pipelines Inc.
Christie	Carol	Hydro One
Greco	Enzo	Union Gas
Lane	Paul	Sun Canadian Pipeline
Basilio	John	Hamilton Utilities Corporation
Lummack	David	South Mount Cable Ltd
MacTaggart	John	CN Rail - Engineering & Environmental Service:
Marshall	Doug	Mountain Cablevision
Mitchell	Colleen	Imperial Oil Products & Chemical Division
		Horizon Utilities Corporation
Newman	Ann	Enbridge Pipelines Inc.
Sutton	Eleanor	
Walker	Astle	Cogeco Cable Inc - 950 Syscon Road
Winkley	John	Southern Ontaio Railway
Woods	Geoff	Canadian National Railway
		Ontario Power Generation

School Boards/Colleges/Universities

Morrissey	David	90 Mulberry Street
Sage	Daryl	Hamilton-Wentworth District School Board

Indian and Northern Affairs Canada
P.O. Box 1960
Brantford, ON N3T 5W5

Ontario Native Affairs Secretariat
720 Bay Street
4th Floor
Toronto, ON M5G 2K1

Ms. Louise Trepanier
Director, Claims East of Manitoba, Comprehensive Claims Branch
Department of Indian and Northern Affairs
10 Wellington Street, Room 1310
Gatineau, Quebec K1A 0H4

Mr. Franklin Roy,
Director, Litigation Management and Resolution Branch
Department of Indian and Northern Affairs
10 Wellington Street, Room 1310
Gatineau, Quebec K1A 0H4

Mr. Don Boswell
Senior Claims Analyst, Specific Claims Branch
Department of Indian and Northern Affairs
10 Wellington Street, Room 1310
Gatineau, Quebec K1A 0H4

Mr, Grant Wedge
Council, Crown Law Office-Civil
Ministry of the Attorney General
720 Bay Street, 8th Floor
Toronto, ON M5G 2K1

Ms. Pam Weaton
Director, Policy and Relationships Branch
Ontario Secretariat of Aboriginal Affairs
720 Bay Street, 4th Floor
Toronto, ON M5G 2K1
J. Monture and/or Paul General

PUBLIC INFORMATION CENTRE No.1

Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion East (SCUBE-East)

Thursday November 1, 2007

Hamilton

PHILIPS ENGINEERING

Municipal Class EA Process

- Many projects related to municipal systems are *similar in nature*, are *carried out routinely*, and have *predictable and mitigable* environmental effects which are investigated according to the Municipal Engineers Association *"Municipal Class Environmental Assessment,"* (June 2000) document.
- Municipal Class Environmental Assessment (Class EA) process categorizes proposed municipal projects according to their anticipated environmental impact, and calls for increasingly stringent review requirements as the magnitude of the anticipated environmental impact increases.
- This project is being carried out according to the requirements of a Master Servicing Plan.
- The Class EA defines a Master Plan as:
  "A Long Range Plan, integrating infrastructure requirements for present and future land use with environmental planning principles. The Plan examines the whole infrastructure system in order to outline a framework for planning subsequent projects and/or developments (Class EA, 2000)."

Hamilton

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Municipal Class EA Process

- Master Servicing Plans have distinguishing features that set them apart from project specific studies. These features include the following:
  - Master Plans are broad in scope and focus on the analysis of a system for the purpose of outlining a framework for the provision of future works and developments.
  - Specific projects recommended in a Master Plan are part of a larger management system and are distributed geographically throughout the study area.
  - The implementation of specific projects occurs over an extended time frame.
- The Water and Wastewater Master Servicing Plan for SCUBE East will follow the Class Environmental Assessment process for Master Plans and will satisfy Phases 1 and 2 of the Class EA Process. As part of the process, public and agency consultation will be undertaken and detailed development and evaluation of alternative water and wastewater servicing strategies will be examined.

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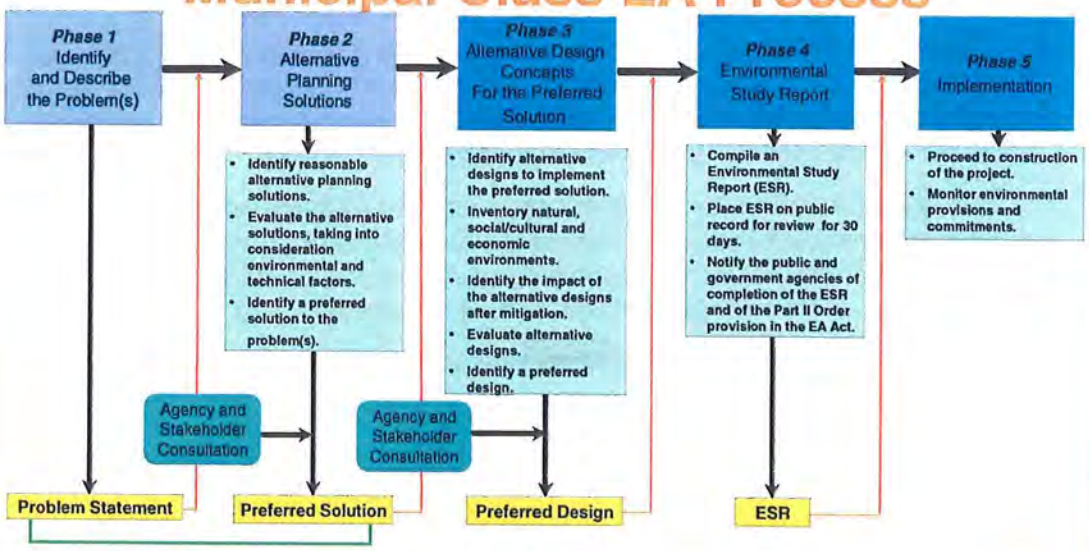
Municipal Class EA Process



The Master Plan Process will include Phases 1 and 2 of the Municipal Class EA Process.

Hamilton

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Background Information

- The City of Hamilton is in the process of preparing a Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area.
- The SCUBE area consists of the lands east of Fruitland Road, north of Highway No. 8 and south of Barton Street, including Winona; and the lands east of Winona, north of Highway No. 8, south of the QEW and west of the City limits. The study area consists of approximately 504 hectares (1245 acres) of land.
- The SCUBE – East is bounded by Winona Road, the South Service Road, the Municipal Boundary, the CNR tracks and a small section that extends to Barton Street (ref. Key Plan).
- Lands within the area have been redesignated from agricultural to commercial.
- As part of the Ontario Municipal Board settlement, development will be allowed to proceed ahead of the Secondary Plan.
- In order to proceed, servicing studies for water and wastewater are required.
- With the agreement of the City, land owners in the area have initiated the Water and Wastewater Master Servicing Plan.
- The completed Water and Wastewater Master Servicing Plan will form part of the Secondary Plan for the SCUBE area.

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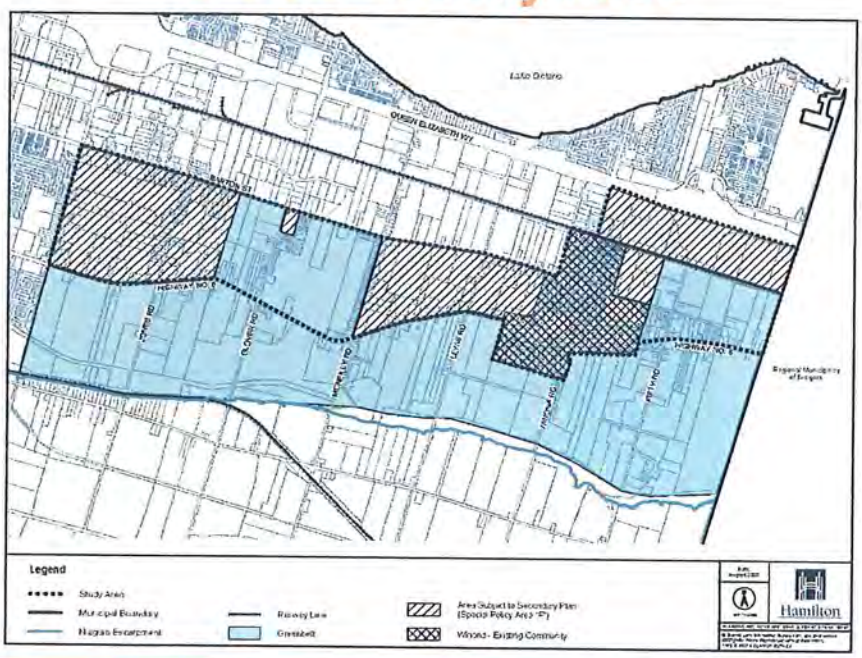
SCUBE Study Area



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Problem/Opportunity Statement

- The City of Hamilton has identified a need and/or opportunity to develop the Stoney Creek Urban Boundary Expansion (SCUBE) area and will prepare a Secondary Plan in 2008.
- Landowners in the SCUBE – East are prepared to initiate the development process immediately, and to accommodate this development, water and wastewater infrastructure extension will be required to service the area.
- Preparation of the Water and Wastewater Master Servicing Plan will proceed ahead of the City's schedule for preparation of the SCUBE Secondary Plan.
- This project is specifically related to water and wastewater. Stormwater Management will be reviewed under a different project.

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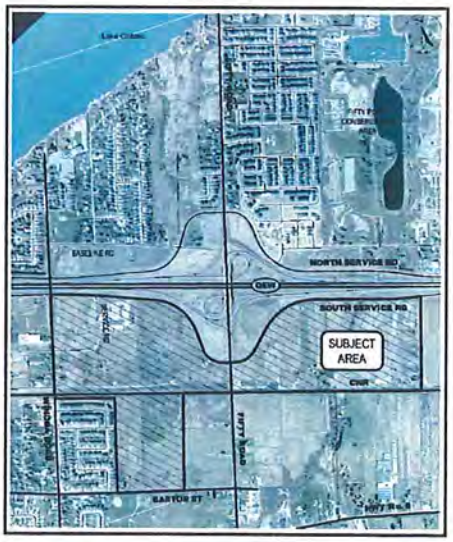
Existing Conditions

- 72 ha area approximately located at the QEW and Fifty Road interchange
- Generally bounded by the South Service Road to the north, the CNR Lands and Barton Street to the south, Winona Road to the east and the City Boundary to the west.



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Existing Conditions – Water System

- 300mm watermain on South Service Road, located west of Winona Road
- 300mm watermain on Winona Road, located between South Service Road and Service Road
- 200 mm watermain on Winona Road, located between Service Road and Barton Street
- 200mm watermain on Service Road
- 200mm watermain on Sonoma Line

Hamilton

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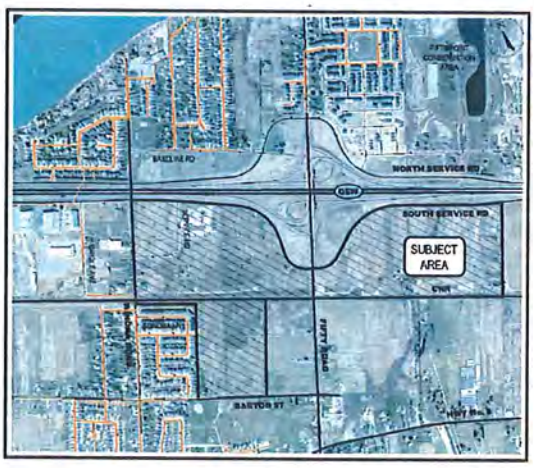
Existing Conditions – Wastewater System

- 1200mm sewer located in the South Service Road R.O.W. located 200m west of Winona Road at the Oriole Avenue Intersection
- 600mm sewer along Winona Road, flowing north towards Victoria Avenue and then west along Victoria Avenue to Oriole Avenue
- 250mm sewer along Sonoma Line



Hamilton

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Next Steps

- Receive public comments by November 15, 2007;
- Review and confirm the results of the data collection and preliminary analysis;
- Review comments on problem identification for water and wastewater;
- Develop alternative solutions for water and wastewater;
- Complete detailed impact analysis;
- Develop proposals for mitigation of negative effects;
- PIC 2 to be scheduled for December 2007;
- Master Planning Document, and
- Council approval of EA prior to filing of the Master Servicing Plan for the 30-day review period.

Hamilton

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How to Provide Your Comments

- Complete a comment sheet
- By Mail
- By Phone
- By Fax
- By e-mail psmeltzer@philipseng.com or uehrenbe@hamilton.ca

Thank you for your Participation!

Hamilton

PHILIPS ENGINEERING

Ontario's Niagara Escarpment
l'Escarpement du Niagara de l'Ontario

Ontario

Niagara Escarpment Commission
232 Guelph Street
Georgetown ON L7G 4B1
Tel. No. (905) 877-5191 - Fax No. (905) 873-7452

Commission de l'escarpement du Niagara
232, rue Guelph
Georgetown ON L7G 4B1
N° de tel. (905) 877-5191 - Télécopieur (905) 873-7452
www.escarpment.org

October 24, 2007

Mr. Paul Smeltzer
Project Manager
Philips Engineering Ltd.,
3215 North Service Road, Box 220
Burlington, Ontario
L7R 3Y2

Dear Mr. Smeltzer:

RE: NOTICE OF STUDY COMMENCEMENT
PUBLIC INFORMATION CENTRE
WATER AND WASTEWATER MASTER SERVICING PLAN
FOR STONEY CREEK URBAN BOUNDARY EXPANSION - EAST

Thank you for the Notice of this Study Commencement dated October 19, 2007.

The proposed undertaking lies outside the Niagara Escarpment Plan Area. No direct or indirect impacts are anticipated to the Plan Area. However, if there is for any reason a change in the Study Area, please advise us of the change.

On the basis of the existing proposed study area, the Niagara Escarpment Commission has no comments, and requires no further mailings on this undertaking.

Yours very truly,

Kathryn Pounder

Kathy Pounder, MA, MCIP, RPP
Senior Planner

RECEIVED
PHILIPS ENGINEERING LTD.
OCT 3 0 2007
FILE NO: 107034-12

Heather Dearlove

From: Paul Smeltzer [psmeltzer@philipseng.com]
Sent: Monday, October 29, 2007 12:00 PM
To: hdearlove@philipseng.com
Subject: FW: PIC - Water Servicing Plan - Stoney Creek-East

Attachments: pic05436.jpg

pic05436.jpg (2 KB)

Heather, FYI. Paul

-----Original Message-----
From: Ann.Newman@enbridge.com [mailto:Ann.Newman@enbridge.com]
Sent: Monday, October 29, 2007 11:10 AM
To: psmeltzer@philipseng.com; uehrenbe@hamilton.ca
Subject: PIC - Water Servicing Plan - Stoney Creek-East

Thank you for the information regarding the PIC for the Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Expansion - East.

Enbridge Pipelines Inc. does not have any facilities within the Stoney Creek area and therefore does not have any comments or concerns with regards to the project.

Please feel free to remove Enbridge Pipelines Inc. from the distribution list for further circulations.

Regards,

(Embedded image moved to file: pic05436.jpg)

Ann Newman CET
Crossings Coordinator

Tel: 519 339 0503
Fax: 519 339 0510
toll free: 800 668 2951
ann.newman@enbridge.com

Enbridge Pipelines Inc.
801 Upper Canada Drive
PO Box 128
Sarnia, ON N7T 7H8
Canada (courier N7W 1A3)

-----Original Message-----
From: Miranda Lesperance [mailto:lesperancem@inac-ainc.gc.ca]
Sent: Tuesday, October 30, 2007 8:13 AM
To: psmeltzer@philipseng.com
Cc: uehrenbe@hamilton.ca
Subject: Water and Wastewater Master Plan - Stoney Creek Urban BoundaryExpansion

Good Morning,

Please find attached the response from the Indian and Northern Affairs Canada - Ontario Region Environment Unit response to your letter of October 19, 2007 regarding the Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion.

Should you require a signed copy of the response for your project file, please do not hesitate to contact me.

Thank you for the opportunity to comment.

Sincerely,

Miranda Lesperance
Environment Officer
Environment Unit
INAC - Ontario Region
25 St. Clair Ave E 8th Floor
Toronto, ON M4T 1M2
Phone (416) 973-5899
Fax (416) 954-4328

Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

October 30, 2007

Your file Votre référence
107034-12
Our file Notre référence
5010-4
#192579

Paul Smeltzer
Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington, ON
L7R 3Y2

Dear Mr. Smeltzer:

RE: Notice of Study Commencement and Public Information Centre Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion - East

Thank you for your letter of October 19, 2007 regarding the above project.

For all provincial and/or municipal undertakings, Indian and Northern Affairs Canada requests that the proponent of such projects make efforts directly from the initiation of a project to identify and notify all potentially interested First Nation communities. It is recommended that this identification and notification occur at the earliest planning stages of the undertaking and if requested by any First Nation(s), maintain communication with such communities. To assist with identifying First Nations and other Aboriginal groups within the vicinity of a specific proposed project, Indian and Northern Affairs Canada can provide the following information sources:

- The Chiefs of Ontario website (http://www.chiefs-of-ontario.org) provides a directory of contact information for all First Nations and Chiefs, as well as a map of the locations of all Ontario First Nations.

- Natural Resources Canada produced provincial maps, showing all First Nation reserve lands, are available for purchase at:
  http://cccm.nrcan.gc.ca/english/canada_lands_index_e.asp

- Natural Resources Canada's online *Historical Indian Treaties* map, showing historical First Nation treaties across Canada, is available at:
  http://atlas.nrcan.gc.ca/site/english/maps/historical/indiantreaties/historicaltreaties

- A search by place name at the Canadian Geographical Names database (http://geonames.nrcan.gc.ca/search/search_e.php) will generate a map which shows any nearby Indian reserve lands in grey.

- The Métis Nation of Ontario (http://www.metisnation.org/) may be able to provide information regarding Métis interests with respect to a particular project.

- The Ontario Federation of Indian Friendship Centres website provides a list of all friendship centres in Ontario, at: http://www.ofifc.org/Centres/OfficeList.asp?Region='ON'

- For enquiries regarding land claims in Ontario, please contact the Director General of the Comprehensive Claims Branch at (819) 994-7521, the Director General of Specific Claims Branch at (819) 994-2323 and the Director General of Litigation Management and Resolution Branch at (819) 997-3582.

If, however, the proponent believes that the proposed project is likely to also trigger a requirement for a federal environmental assessment under the *Canadian Environmental Assessment Act* (CEAA), we advise that the proponent contact the Canadian Environmental Assessment Agency early in the planning process, and provide a project description to them. The Agency will notify federal agencies, including INAC, of the proposed project as appropriate, in accordance with the requirements of the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements*. INAC will, in turn, provide input to the Agency regarding our interest in the project and/or First Nation contact information wherever warranted.

Thank you for your time and consideration.

Sincerely,

Miranda Lesperance
Environment Officer
Environment Unit
INAC - Ontario Region
25 St. Clair Avenue E. 8th Floor
Toronto, Ontario M4T 1M2
lesperancem@inac.gc.ca

cc: Udo Ehrenberg, City of Hamilton

This letter has been distributed electronically. If you require a signed copy, please contact the author at the address provided above.

Canada

Heather Dearlove

From: Paul Smeltzer [psmeltzer@philipseng.com]
Sent: Thursday, November 01, 2007 5:53 PM
To: Hdearlove@philipseng.com
Subject: Fw: SCUBE Mailing List Request

Heather, here is someone to add. Paul
Sent on the TELUS Mobility network with BlackBerry

-----Original Message-----
From: "Roland Dube" <RDube@westlanddevelopments.com>

Date: Thu, 1 Nov 2007 17:23:49
To:<psmeltzer@philipseng.com>
Subject: SCUBE Mailing List Request

Hi Paul,

Could I be added to the mailing list for the SCUBE study area.

Thanks

Roland Dubé
Land Consultant
Westland Developments

Office: 905-296-3586
Mobile: 905-512-1222
Fax: 905-296-3587
Email: rdube@westlanddevelopments.com <mailto:rdube@westlanddevelopments.com>
Web: Westlanddevelopments.com

Regional Engineering
Engineering Services

Canadian National Railway
1 Administration Road
P.O. Box 1000
Concord, Ontario
L4K 1B9
Tel.: 905-669-3155
Fax: 905-760-3406

November 2, 2007

Email: psmeltzer@philipseng.com

Mr. Paul Smeltzer, P. Eng.
Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington, Ontario L7R 3Y2

Re: Stoney Creek Urban Boundary Expansion - East
Water & Wastewater Master Servicing Plan – Class Environmental Assessment

Thank you for your notice dated October 19, 2007 informing us of the study commencement and scheduled Public Information Center for the above noted project.

CN has no concerns at this time, but request to be kept informed throughout the project. During the development of the servicing strategies, CN must be advised if there will be any potential impact to the Railway. CN has interest in this project due to the potential utility crossings of the Grimsby Subdivision between Miles 31.39 and Mile 32.17 within your study area boundary.

Please note, an agreement must be entered into with the Railway in order to proceed with the installation of any utility crossing CN Railway property. For further utility crossing information, please contact CN Utility Desk - Mr. Brennan Jensen at the above address or at 905-669-3184.

Sincerely,
Darylann Perry for
John F. MacTaggart, P.Eng.
Senior Engineering Services Officer

Ministry of the Environment
119 King Street West
12th Floor
Hamilton, Ontario L8P 4Y7
Tel.: 905 521-7640
Fax: 905 521-7820

Ministère de l'Environnement
119 rue King ouest
12e étage
Hamilton (Ontario) L8P 4Y7
Tél. : 905 521-7640
Téléc. : 905 521-7820

Ontario

November 6, 2007

Mr. P. Smeltzer, P.Eng.
Philips Engineering Ltd.
3215 South Service Road, Box 220
Burlington, Ontario
L7R 3Y2

Dear Mr. Smeltzer:

Re: Notice of Study Commencement – MEA Class Environmental Assessment
Stoney Creek Urban Area Expansion – East
Water and Wastewater Master Servicing Plan

Thank you for your letter dated October 19, 2007 regarding the proposed Master Servicing Plan undertaking for the above noted project. To obtain the authority for the individual projects to proceed the municipality must plan the projects in accordance with the *Municipal Engineers Association Municipal Class Environmental Assessment, June 2000* (Class EA).

In accordance with the MEA Class EA, Master Plans are required to address a Minimum of Phases 1 and 2 of the Class EA process. The work undertaken in the preparation of Master Plans should recognize the Planning and Design Process of the MEA Class EA, and should incorporate the key principles of successful environmental assessment planning identified in Section A.1.1. of the MEA Class EA document. It is also important that public and agency consultation take place during each phase of the study process, specifically, at the initiation of the Master Plan and at the selection of the preferred set of alternatives stage.

The general public's "environmental awareness" has increased dramatically in recent years and in therefore, we cannot stress enough the need for the master planning process to ensure that the public is kept well-informed as to the progress that is being made, and that particular effort be made to ensure that information is readily available in as user-friendly language as possible, given the technical nature of the project. You should also be aware that it is becoming Ministry practice to require detailed documentation regarding the public consultation process that has been undertaken and the efforts made to address the public or agencies' concerns, especially where Part II Orders may be received for the individual projects that will arise out of the master planning exercise.

With respect to agency consultation, please keep in mind the range of other approvals and/or permits that may be required in order to implement the specific projects that are identified through the master planning exercise. It is crucial that these agencies are circulated so that their input is obtained and their issues are addressed.

In summary, it is our expectation that the master planning exercise will:

- Address the key principles of successful environmental planning as outlined in Section A.1.1 of the MEA Class EA document;
- Address at least the first two phases of the MEA;
- Allow for an integrated process with other planning initiatives;
- Provide a strategic level assessment of various options to better address overall system needs and potential impacts and mitigation;
- Take a system-wide approach to planning which relates infrastructure either geographically or by a particular function;
- Recommend an infrastructure master plan which can be implemented through the implementation of separate projects; and
- Include a description of the specific projects including any other approvals that will be required.

Once the Master Plan is finalized, a final public notice is issued allowing the public an opportunity to review and provide input to the municipality. Depending on the Master Plan Approach selected, the final public notice may also become the Notice of Completion for any Schedule B or C projects identified within the study. You are reminded that when concerns are raised during the public comment period, the concerned party should be consulted in an attempt to resolve the concerns. Discussions to this end should proceed for an appropriate period of time, even if this means the 30-day review period is exceeded.

We request that the proponent forward one copy of the Notice of Completion and be prepared to provide the complete Master Plan Document to this Office for our review, filing and potential comments.

Should you have any questions regarding the Class EA process, please feel free to contact me at (905) 521-7864 or Barbara.ryter@ontario.ca.

Sincerely,

Barbara Ryter

Barbara Ryter
Environmental Assessment & Planning Coordinator
West Central Regional Office

Affaires indiennes et du Nord Canada | Indian and Northern Affairs Canada

November 14, 2007

Mr. Paul Smeltzer
Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
BURLINGTON, ON L7R 3Y2

RE: Notice of Study Commencement and Public Information Centre
Water and Wastewater Master Servicing Plan
For the Stoney Creek Urban Boundary Expansion – East

Dear Mr. Smeltzer,

I am responding to the request for information sent to the Comprehensive Claims Branch, by mail, on October 19, 2007.

We can confirm that there are no comprehensive claims in the City of Hamilton, Ontario. We cannot make any comments regarding potential or future claims, or claims filed under other departmental policies. This includes claims under Canada's Specific Claims Policy or legal action by the First Nation against the Crown. For more information, I suggest you contact the Director General of Specific Claims Branch at (819) 994-2323 and the Director General of Litigation Management and Resolution Branch at (819) 997-3582.

INAC- Comprehensive Claims Branch does not have any specific interest in the project and would request to be taken out of the mailing list.

Yours truly,

Kevin Clement, A/ Director
for
Lynn Bernard, Director General
Comprehensive Claims Branch

Canada

From: Stone, Mike (MNR) [mailto:mike.stone@ontario.ca]
Sent: Monday, December 03, 2007 4:32 PM
To: psmeltzer@philipseng.com
Cc: uehrenbe@hamilton.ca
Subject: SCUBE Water & Wastewater Master Servicing Plan Class EA Study

Dear Mr. Smeltzer,

Thank you for providing this office with the notice of commencement for the Stoney Creek Urban Boundary Expansion (SCUBE) Water and Wastewater Master Servicing Study. This notice requested agencies provide information on environmental conditions for the site. In this regard, the Ministry notes a section of the Fifty Mile Creek Wetland Complex (non-provincially significant) and Fifty Mile Creek pass through the eastern portion of the study area. The Ministry has no other records for natural heritage features of significance on the site. However, it may be determined through this study that natural heritage features/values, previously not known for the area, exist. Natural heritage features and values should be given the appropriate level of consideration during the study.

Kind Regards,

Mike Stone

--
Mike Stone
District Planner
Ministry of Natural Resources
Guelph District

Heather Dearlove

From: Ehrenberg, Udo [uehrenbe@hamilton.ca]
Sent: Thursday, December 06, 2007 11:21 AM
To: Giovanni Paolini; PHILIPS_Paul Smeltzer; Mahood, Alissa; Khes, Brenda; Heather Dearlove
Cc: Skrypniak, Lorissa
Subject: RE: s c urban expansion
Follow Up Flag: Follow up
Flag Status: Completed

Thank you for your comments and information Mr. Paolini.

I am forwarding your email to Alissa Mahood who is undertaking a Secondary Planning Study for the Stoney Creek Urban Boundary Expansion. The issues you have identified are best addressed through this Secondary Plan process. By copy of this email I ask that Alissa respond to your concerns.

The study we are currently undertaking pertains to water servicing and wastewater servicing for a smaller portion of the Urban Boundary Expansion area. If you would like more information specifically about the water distribution or wastewater collection systems our Consultants at Philips Engineering can elaborate. We will be at the Stoney Creek Municipal Centre on December 13 from 6 to 8pm where we will have material and staff to elaborate on servicing. I hope to see you there.

Sincerely,

Udo

Udo Ehrenberg, P.Eng.
Project Manager
Plant Capital and Planning
Public Works Department
55 John Street North - 6th Floor
Hamilton, ON L8R 3M8

tel: 905-546-2424 ext. 2499
fax: 905-546-4491
email: uehrenbe@hamilton.ca

-----Original Message-----
From: Giovanni Paolini [mailto:johnpaolini@cogeco.ca]
Sent: December 6, 2007 10:51 AM
To: Ehrenberg, Udo
Subject: s c urban expansion

G Paolini
861 h. way # 8
stoney creek ont
L 8 E 5J 3
905 643 2894
e m john paolini @cogeco.ca

sir

I attended last Dave M meeting and I am quite concerned with what I learned
it seemed to me that the city of S C A city of 60 000 is and as been short serviced in comparison of grimsby beamsville smithville these small center have all the commodity that a city scould have including a hospital in grimsby commodity that stoney c does not have.
the last administration all they did was build houses forcing us to go hamilton ankaster burlington or grimsby
my concern now is that the situation is changing the commodity the need of this town are again going at the border of grimsby we the citizens that live between millen rd and glover rd have no choice but to drive on either end of the town that is centennial or 50 rd the extreme of east and west
suggestion: before the land around Fruitland road is gobbled up again by the housing, I would suggest that a plaza for this town to be built around the Fruitland area so that all of the city has a central service to enjoy.

Yours very truly,
John Paolini
before

SIX NATIONS COUNCIL

November 19, 2007

Paul Smeltzer, P.Eng.
Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington ON L7R 3Y2

Dear: Mr. Ehrenberg

Re: Public Information Centre November 1, 2007 – Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion - East

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Due to a lack of capacity, a representative from the Lands and Resources Department at the Six Nations of the Grand River Territory (Six Nations) was unable to attend the Public Information Centre held on November 1, 2007 regarding the Notice of Study Commencement and Public Information Centre for the Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion – East.

Since we were unable to attend, please provide a copy of the PIC information Package and a follow-up report from the PIC held on November 1, 2007. We will be able to assess the project after we receive the requested material. Six Nations appreciates being kept informed by the City of Hamilton concerning any and all development applications.

Please forward new information, studies and supporting documentation in relation to this proposal to Six Nations Lands and Resources, 2498 Chiefswood Road, P.O. Box 5000, Ohsweken, ON NOA 1M0. For further information, please do not hesitate to contact Lonny Bomberry at (519) 753-0665 ext. 12.

Respectfully Yours,

George A. Montour

Councillor George Montour, Chair
Lands and Resources Portfolio
SIX NATIONS OF THE GRAND RIVER

CC: Mr. Lonny Bomberry, Director: Six Nations Lands and Resources
Mr. Leroy Hill, Secretary: Haudenosaunee Six Nations Confederacy Council
Minister Michael Bryant, Ontario Ministry of Aboriginal Affairs
Minister Chuck Strahl, Indian and Northern Affairs Canada

This letter is without prejudice to the positions that Six Nations has and may take in respect to its claims and litigation in relation to the Six Nations Tract/ Haldimand Proclamation Lands.

December 20, 2007
Our File: 107034-10

Six Nations Lands and Resources
2498 Chiefswood Road, P.O. Box 5000
Oshweken, ON N0A 1M0

ATTENTION: Mr. George Montour, Chair.
Lands and Resources Portfolio

Dear Sir:

RE: Water and Wastewater Master Servicing Plan for the
Stoney Creek Urban Boundary Expansion East (SCUBE-East)

Thank you for your letter dated November 19, 2007 addressed to Udo Ehrenberg concerning the Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion East (SCUBE-East). Consultation is an important part of the Class Environmental Assessment and we appreciate any comments you may have about the study.

As you are aware we held the first Public Information Centre (PIC) on November 1st, 2007 and we presented the following to the public:

- the problem and opportunity statement;
- the review of background information and previous reports;
- the preliminary results of the data collection and analysis,
- and Initial problem identification for water and wastewater.

As you requested, we have enclosed a copy of the material that was presented at the first Public Information Centre.

Since the receipt of your letter we have held the second Public Information Centre on December 13, 2007. The following information was presented at the second PIC:

- description of study area and anticipated developments,
- alternative water and wastewater servicing solutions,
- the evaluation criteria,
- assessment of alternatives present, and
- the preferred Water and Wastewater Servicing Alternative.

The material presented at the second PIC has been enclosed for your review.

Should you have any questions or concerns do not hesitate to contact Paul Smeltzer at 905-335-2353 ext. 1283 (psmeltzer@philipseng.com) or myself at 905-335-2353 ext. 1276 (hdearlove@philipseng.com)

Yours truly,

PHILIPS ENGINEERING LTD.

Per: Heather Dearlove, B.Sc.

G:\Work\107034\Corr\Letter\JStephen 07-04-17.doc

c.c. Udo Ehrenberge – City of Hamilton
Paul Smeltzer - Philips Engineering Ltd.

Heather Dearlove

From: Paul Smeltzer [psmeltzer@philipseng.com]
Sent: Tuesday, December 11, 2007 6:19 AM
To: 'David Hambleton'; uehrenbe@hamilton.ca
Cc: rscheckenberger@philipseng.com; hdearlove@philipseng.com
Subject: RE: SCUBE east lands

Thank you for your note Mr. Hambleton. The work I am doing is related to the water and wastewater servicing for the SCUBE East Lands. I will forward your email to my colleague, Ron Scheckenberger. His task is to address stormwater for the SCUBE East lands. Paul Smeltzer

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From: David Hambleton [mailto:david.hambleton@cogeco.ca]
Sent: Monday, December 10, 2007 10:11 PM
To: psmeltzer@philipseng.com; uehrenbe@hamilton.ca
Subject: SCUBE east lands

Gentlemen:

I am the owner and resident of 1498 Baseline Road since 1996. Restoration and preservation of the 1920 vintage house and barn are an on-gong project with emphasis on retaining the "heritage appeal" of the property.

There's a ravine with a drainage ditch through the west side of the property that may be impacted by SCUBE south of the QEW. I maintain the watercourse by regularly removing tree limbs and debris that would otherwise impede flow.

When the QEW was expanded, significant additional drainage was directed through the ditch with no notice to me regarding alteration of the previous typical flow patterns. Fortunately, the catchment pond between the QEW and the North Service Road seems to temper the additional drainage so there has been no flooding of the ravine as a result.

I understood when I purchased the property that the ravine was classified as a flood plain. Research would likely show the three story barn on the side of the ravine was constructed long before the flood plain designation. Local historical knowledge is that occasional flooding of a foot or so was eliminated by improved flow through the Fifty Point Conservation Area.
The ditch has been at capacity several times since I've lived here but the barn has not been flooded.

I believe there are regulations regarding changing the drainage of properties to avoid negatively affecting down-stream property owners. I presume in the case of a long term wastewater plan, downstream property owners will be protected from potential risks associated with changed drainage patterns. I would be strongly opposed to my property being "appropriated without compensation" for someone else's use.

Please provide assurance that my right to enjoy my property and use of existing structures will not be affected by any up-stream development.
Thanx!

David Hambleton
1498 Baseline Road
Stoney Creek Ontario
L8E 5G4

APPENDIX A2

PIC NO. 2

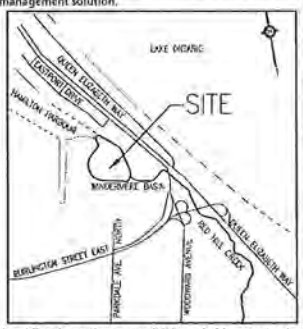
NOTICES

NOTICE OF PUBLIC INFORMATION CENTRE #2

Municipal Class Environmental Assessment for the Enhancement of Windermere Basin

THE STUDY

The City of Hamilton is undertaking a Municipal Class Environmental Assessment (EA) process to identify a solution for dealing with sediment in Windermere Basin (Basin). Windermere Basin is located at the southeast corner of Hamilton Harbour at the mouth of the Red Hill Creek. Over the years, the Basin has acted as a settling basin for sediments that are discharged through Red Hill Creek. The Municipal Class EA study has identified and assessed the alternatives to managing sediment transport and deposition in the Basin, in order to select a preferred management solution.



A public information centre (PIC) was held on September 18th, 2007 to present the evaluation of alternatives for dealing with sediment in the Basin. The upcoming PIC on December 11, 2007 will present more details about the recommended preferred alternative, which involves constructing a watercourse through to the harbour and creating aquatic habitat within the remainder of the Basin (Wetland). It will also provide the opportunity for interested individuals to ask questions of the Study Team and comment on the design of the recommended preferred alternative.

THE PROCESS

This study follows the planning and design process for a Schedule B project as defined in the Municipal Engineers Association Municipal Class Environmental Assessment document (June 2000). This project will also trigger a screening level environmental assessment under the Canadian Environmental Assessment Act. Upon completion of the study, a Project File Report will be available for public review and comment. A Notice of Completion will be published at that time, indicating where and how the public can obtain access to the report.

PUBLIC COMMENTS INVITED

There is an opportunity at any time during this process for interested persons to review outstanding issues and bring concerns to the attention of the Project Manager or Consultant. A Project Advisory Group (PAG) for Windermere Basin was established in 2004 and will provide input and feedback during the EA process.

PUBLIC INFORMATION CENTRE

You are invited to attend Public Information Centre # 2:
Lakeland Community Centre
180 Van Wagners Beach Road
Tuesday December 11th, 2007
6:00pm-8:30pm

If you have any questions or comments or wish to be added to the study mailing list, please contact either:

John Helka, C.E.T.
Project Manager
Water & Wastewater Div., City of Hamilton
55 John Street North, 6th Floor
Hamilton, ON L8R 3M8
905-546-2424, Ext. 2826
Fax: 905-546-4491
Email: windermerebasin@hamilton.ca

Scott Cole, P.Eng.
Project Manager
Cole Engineering Group Ltd.
100 Renfrew Drive, Suite 100
Markham, Ontario L3R 9R6
416-987-6161
Fax: 905-940-2064
Email: scole@coleengineering.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

Open Space Development & Park Planning
Capital Planning & Implementation Division
Hamilton
Public Works

OPEN HOUSE
Courtcliffe Park & Joe Sam's Leisure Park Redevelopment

Tuesday, December 4, 2007
at 6:30 - 8:30 p.m.
Carlisle COMMUNITY CENTRE, BANQUET HALL

Master Planning for the redevelopment of both Courtcliffe Park and Joe Sam's Leisure Park in Flamborough is underway. Drawings will be on display and staff will be available to answer questions. The programs for both parks include several phases of construction for the development of sports facilities and parking. The master plan for Courtcliffe Park also includes provision for play equipment. The meeting will be in an open house-style, with opportunity for public comment.

For more information:
Cynthia Graham
905-546-2424 ext. 2337
Open Space Development and Park Planning,
Public Works Department,
City of Hamilton
www.hamilton.ca/OpenSpace

NOTICES

Notice of Completion of Addendum - City of Hamilton Ward One Combined Sewage Overflow Storage Tank Ewen Road CSO Storage Tank Review

In 2004, the City of Hamilton completed a Master Plan / Class Environmental Assessment study identifying the preferred Ewen Road CSO Storage Tank (sized at approximately 5,900 m3) in accordance with the Municipal Engineers Association Municipal Class Environmental Assessment (June 2000). At that time, the City evaluated a wide range of alternatives and developed a comprehensive strategy to provide CSO storage facilities in Ward One. These solutions were developed in consultation with the Steering Committee and interested agencies and members of the public at three Public Open Houses.

Soil investigations completed as part of the detailed design of the Ewen Road CSO Storage Tank facility indicated that the soil conditions at the preferred site were poor, and the design of the facilities at this location would require the installation of very deep foundation piles to support the weight of the storage tank. These conditions would significantly increase the cost to construct the proposed storage tank at this location. Therefore, the City of Hamilton identified the need to review the recommended location of the Ewen Road CSO Storage Tank.

As a result of the City's Master Plan Review, the CSO tank could be constructed beneath the McMaster Zone 6 parking lot site. The University has agreed to allow the City to construct the CSO tank there. The Hamilton Conservation Authority has also indicated their support of the proposed move to the new University site.

The approximate location of the revised recommended project is shown on the map below.

Subject to comments received as a result of this Notice and obtaining the necessary approvals, the following revised Ewen Road CSO Storage Tank location is recommended for implementation.

The Master Plan Review has been placed on public record for a public review period ending on January 7, 2007.

Copies of the Master Plan Review are available during the review period at no cost by visiting the City Public Works department (address below) during regular hours of operation. The Master Plan Review is available for review at the following locations and hours of service.

Westdale Library	Mills Library McMaster University	Office of the City Clerk	City Centre
955 King St. W.	1280 Main St. W.	77 James St. N.,	77 James St. N.
Hamilton, ON	Hamilton, ON	Suite 220	Suite 320
L8S 1K9	L8S 4L6	Hamilton, ON	Hamilton, ON
905-546-3456		L8R 2K3	L8R 2K3
		905-546-CITY	905-546-CITY

If after reviewing the Master Plan, you have questions or concerns with any of the proposed projects listed above, please follow this procedure:
Contact the following City staff to discuss your questions or concerns with the revised project.

Natasha D'Souza, Project Manager, Environmental Planning City of Hamilton Public Works Department
77 James Street North, Suite 320, Hamilton, ON L8R 2M3
Phone: (905) 546-2424 ext 6390 Fax: (905) 546-4435 E-mail: eplanning@hamilton.ca

If your concerns regarding the revised Ewen Road CSO Storage Tank project as described in this notice cannot be resolved in discussion with the City, you may request that the Minister of the Environment make a Part II Order pursuant to the Environmental Assessment Act. A Part II Order may require the City to comply with Part II of the Act which addresses individual environmental assessments. Written requests must be received by the Minister of the Environment by January 7, 2008:

Honourable Laurel C. Broten, Minister of the Environment
135 St. Clair Avenue West, 12th Floor, Toronto, Ontario M4V 1P5

A copy of the request must also be sent to the City of Hamilton Clerk at the above City address. If no request is received by January 7, 2008, the City will proceed to implement the project descried above as outlined in the City of Hamilton Ward One CSO Tank - Ewen Road CSO Storage Tank Review.

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.

Clerk, City of Hamilton

This notice issued November 30, 2007 and December 7, 2007

WATER AND WASTEWATER MASTER SERVICING PLAN FOR THE STONEY CREEK URBAN BOUNDARY EXPANSION – EAST

CLASS ENVIRONMENTAL ASSESSMENT NOTICE OF PUBLIC INFORMATION CENTRE No. 2

THE STUDY

The City of Hamilton has initiated a Water and Wastewater Master Servicing Plan process for the Stoney Creek Urban Boundary Expansion – East lands (See attached location map). The City of Hamilton is in the process of preparing a Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area. The Water and Wastewater Master Servicing Plan will become a component of the SCUBE Secondary Plan.

THE PROCESS

This project is being planned under the planning and design process for Master Plan as defined in the Municipal Engineers Association's *Municipal Class Environmental Assessment* (June 2000 – updated October 2007).

The Class EA defines a Master Plan as:

"A long range plan, integrating infrastructure requirements for present and future land use with environmental planning principles. The plan examines the whole infrastructure system in order to outline a framework for planning subsequent projects and/or developments (Class EA, 2000 - updated October 2007)."

This project will follow the Class Environmental Assessment process for Master Plans and will satisfy Phases 1 and 2 of the Class EA Process. As part of the process, public and agency consultation will be undertaken and detailed development and evaluation of alternative water and wastewater servicing strategies will be examined.

PUBLIC INFORMATION CENTRE 2

The Public Information Centre will be held to present:

- Description of Study Area and Anticipated Developments
- Alternative Water and Wastewater Servicing Solutions
- Evaluation Criteria
- Assessment of Alternatives
- Present Preferred Water and Wastewater Servicing Alternative

DATE: Thursday December 13, 2007
TIME: 6:00 p.m. to 8:00 p.m.
LOCATION: Stoney Creek Municipal Building, 777 Highway 8, Stoney Creek

PUBLIC COMMENTS INVITED

There is an opportunity at any time during this process for interested persons to review outstanding issues and bring concerns to the attention of the Project Managers. If you have any questions or comments or wish to be added to the study mailing list, please contact:

Paul Smeltzer, P.Eng., Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington, Ontario L7R 3Y2
Ph. 905-335-2353 ext. 1283
Fax 905-335-1414
E-mail psmeltzer@philipseng.com

Udo Ehrenberg, P. Eng., Project Manager
City of Hamilton, Plant Capital and Planning
Public Works Department
55 John Street North, 6th Floor
Hamilton, ON L8R 3M8
Ph. (905) 546-2424 ext. 2499 Fax (905) 546-4491
E-mail uehrenbe@hamilton.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act*. With the exception of personal information, all comments will become part of the public record.
This Notice issued on November 30 and December 7, 2007.

NOTICES

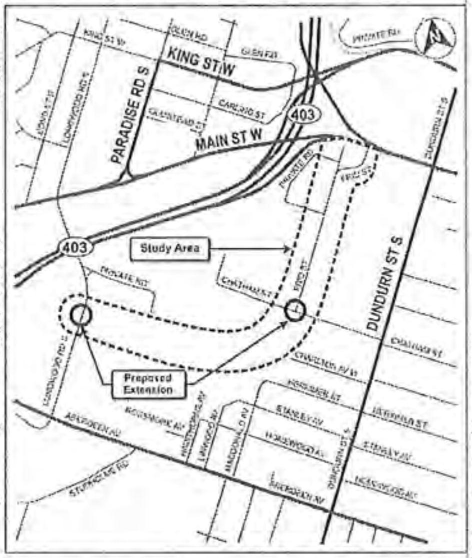
NOTICE OF STUDY COMMENCEMENT AND CLASS ENVIRONMENTAL ASSESSMENT PUBLIC INFORMATION CENTRE

Frid Street Extension

THE STUDY
The City of Hamilton has initiated the Municipal Class Environmental Assessment (EA) process to undertake Phases 3 and 4 for the Frid Street extension (see location on attached map). The Kirkendall Neighbourhood Traffic Management Plan that was completed in September 2006 identified a need to improve access for all transportation modes between the Kirkendall Neighbourhood, West Hamilton Industrial District and Longwood Road (McMaster Innovation Park). The Kirkendall Study addressed Phases 1 and 2 of the EA process and the Frid Street extension needs to go through Phases 3 and 4 in order to finalize the road design.

THE PROCESS
This project is being planned as a Schedule C project under the *Municipal Engineers Association Municipal Class Environmental Assessment (October 2000, as amended in 2007).*

Upon completion of the study, an Environmental Study Report will be available for public review and comment. Another advertisement will be published at that time.



Hamilton Public Works	Frid Street Extension Class Environmental Assessment Phase 3 &4 (Ward 1)		
	General Manager Scott Stewart C.E.T.	November 2007	Map Not to Scale

PUBLIC INFORMATION CENTRE
The following Public Information Centre will be held to provide background on the issues that have been addressed to this point and to receive public input:

DATE: December 18, 2007
TIME: 6:00 p.m. to 8:30 p.m.
A presentation will take place at 7:00 p.m.
LOCATION: Hamilton Spectator Auditorium, 44 Frid Street, Hamilton

PUBLIC COMMENTS INVITED
There is an opportunity at any time during this process for interested persons to review outstanding issues and bring concerns to the attention of the Project Managers. If you have any questions or comments or wish to be added to the study mailing list, please contact:

Lorissa Skrypniak, MCIP RPP
Sr. Project Manager
Environmental Planning
City of Hamilton
77 James Street North, Ste 320
Hamilton, Ontario
L8R 2K3
Ph. 905-546-2424 ext. 2732
Fax 905-546-4435
Email eplanning@hamilton.ca

Jack Thompson
Project Manager
McCormick Rankin Corporation
2655 North Sheridan Way
Mississauga, Ontario
L5K 2P8
Ph. 1-905-823-8500
Fax 1-905-823-8503
Email jthompson@mrc.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act.* With the exception of personal information, all comments will become part of the public record.

This Notice issued on December 7 and 14, 2007.

NOTICE
ONTARIO MUNICIPAL BOARD PREHEARING CONFERENCE

OMB Case No.: PL070386
OMB File No.: O070052

Parties: City of Hamilton, Hamilton Metal Trading Corp., Aberdeen Holdings Inc., Trinity Properties Investments Inc., The Gore District Land Trustee Corporation on behalf of the Gore District Land Trust, LaFarge Canada Inc.

Participants: 886247 Ontario Ltd. o/a Sandona Corporate Village, Sergio Defieo, Chafrid Holdings Ltd., 1612464 Ontario Ltd.

Subject: Proposed Official Plan Amendment No. 210
Proposed Zoning By-law Amendment No. 07-043

NOTICE OF PREHEARING CONFERENCE

The Ontario Municipal Board will conduct a prehearing conference respecting the lands identified as the West Hamilton Innovation District, illustrated on the map attached.

Trinity Properties Investments Inc. has requested consideration of commercial uses on part of the lands including approximately 32,980 square metres (355,000 square feet) of commercial space.

This notice is being provided to advise the community of the commercial development requested by Trinity Properties Investments Inc., which differs from that envisioned in Official Plan Amendment No. 210 and Zoning By-law Amendment No. 07-043, as previously presented to the community.

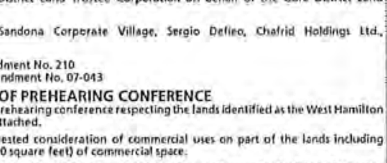
If you do not attend the prehearing conference, the Ontario Municipal Board may proceed in your absence and you will not be entitled to any further notice of these proceedings.

TIME AND PLACE OF PREHEARING CONFERENCE

Time: 10:00 am.
Date: January 15, 2008
Place: 50 Main Street East, Main Floor, Hamilton, Ontario

PURPOSE OF PREHEARING CONFERENCE
The Board has already held two (2) prehearing conferences in this matter. This prehearing conference is to respond to this Notice of the proposed commercial component and to give interested parties the opportunity to participate in the proceedings. The conference will deal with preliminary and procedural matters, including the following:

- **Identification of additional parties and participants**
- **Identification of additional issues**
- **Confirmation of start date of the hearing**
- **Confirmation of direction for exchange of witness lists/statements**
- **Possibility of settlement of any or all of the issues.**
- **Such further matters as the Board considers appropriate.**



West Hamilton Innovation District Secondary Plan
Subject Lands
PLANNING AND ECONOMIC DEVELOPMENT DEPARTMENT
Hamilton

EVIDENCE
Evidence or formal statements may also be heard at the prehearing conference in an attempt to settle the matters in dispute. Note that even if no settlement is reached, the Board may make a final decision on the evidence it has received.

All parties or their representatives should attend the prehearing conference.

Any questions relating to this matter should be directed to Brenda Khes, Senior Project Manager, Planning and Economic Development Department,
77 James Street North, Suite 250, Hamilton ON, L8R 2K3
Phone: 905-546-2424 x1224 or e-mail bkhes@hamilton.ca

Kevin Christenson, Clerk,
City of Hamilton, Hamilton, Ontario

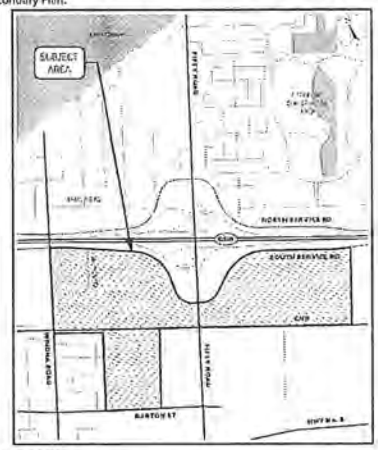
DATED at the City of Hamilton, this 7th day of December, 2007.

NOTICES

WATER AND WASTEWATER MASTER SERVICING PLAN FOR THE STONEY CREEK URBAN BOUNDARY EXPANSION – EAST

CLASS ENVIRONMENTAL ASSESSMENT NOTICE OF PUBLIC INFORMATION CENTRE No. 2

THE STUDY
The City of Hamilton has initiated a Water and Wastewater Master Servicing Plan process for the Stoney Creek Urban Boundary Expansion – East lands (See attached location map). The City of Hamilton is in the process of preparing a Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area. The Water and Wastewater Matter Servicing Plan will become a component of the SCUBE Secondary Plan.



THE PROCESS
This project is being planned under the planning and design process for Master Plan as defined in the Municipal Engineers Association's *Municipal Class Environmental Assessment* (June 2000 – updated October 2007).

The Class EA defines a Master Plan as:

"A Long range plan, integrating infrastructure requirements for present and future land use with environmental planning principles. The plan examines the whole infrastructure system in order to outline a framework for planning subsequent projects and/or developments (Class EA, 2000 - updated October 2007)."

This project will follow the Class Environmental Assessment process for Master Plans and will satisfy Phases 1 and 2 of the Class EA Process. As part of the process, public and agency consultation will be undertaken and detailed development and evaluation of alternative water and wastewater servicing strategies will be examined.

PUBLIC INFORMATION CENTRE 2
The Public Information Centre will be held to present:

- Description of Study Area and Anticipated Developments
- Alternative Water and Wastewater Servicing Solutions
- Evaluation Criteria
- Assessment of Alternatives
- Present Preferred Water and Wastewater Servicing Alternative

DATE: Thursday December 13, 2007
TIME: 6:00 p.m. to 8:00 p.m.
LOCATION: Stoney Creek Municipal Building, 777 Highway 8, Stoney Creek

PUBLIC COMMENTS INVITED
There is an opportunity at any time during this process for interested persons to review outstanding issues and bring concerns to the attention of the Project Managers. If you have any questions or comments or with to be added to the study mailing list, please contact:

Paul Smeltzer, P.Eng., Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington, Ontario L7R 3Y2
Ph. 905-335-2353 ext. 1283
Fax 905-335-1414
E-mail psmeltzer@philipseng.com

Udo Ehrenberg, P. Eng., Project Manager
City of Hamilton, Plant Capital and Planning
Public Works Department
55 John Street North, 6th Floor
Hamilton, ON L8R 3M8
Ph. (905) 546-2424 ext. 2499 Fax (905) 546-4491
E-mail uehrenbe@hamilton.ca

Information will be collected in accordance with the *Freedom of Information and Protection of Privacy Act.* With the exception of personal information, all comments will become part of the public record.This Notice issued on November 30 and December 7, 2007.

Food Premises Orders and Convictions

Food Premises Orders and Convictions Under the Health Protection and Promotion Act (HPPA)

Hamilton Public Health Services regularly inspects all food premises within city limits, including restaurants. Information on recent Convictions and Orders will be published one time per new Conviction or Order.

Current Convictions and Orders under the Health Protection and Promotion Act (HPPA):

Location: The Bean Bar, 1012 King Street West, Hamilton
Conviction Date: October 22, 2007
Detail/Action: Operate food premise maintained in manner adversely affecting sanitary condition

For more information on the Food Safety Inspection Program visit our website at www.hamilton.ca/phcs

PUBLIC INFORMATION CENTRE No.2

Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion East (SCUBE-East)

Thursday December 13, 2007

Hamilton

PHILIPS ENGINEERING

Municipal Class EA Process

- Many projects related to municipal systems are *similar in nature*, are *carried out routinely*, and have *predictable and mitigable* environmental effects which are investigated according to the Municipal Engineers Association *"Municipal Class Environmental Assessment,"* (October 2007) document.
- Municipal Class Environmental Assessment (Class EA) process categorizes proposed municipal projects according to their anticipated environmental impact, and calls for increasingly stringent review requirements as the magnitude of the anticipated environmental impact increases.
- This project is being carried out according to the requirements of a Master Servicing Plan.
- The Class EA defines a Master Plan as:
  "A Long Range Plan, integrating infrastructure requirements for present and future land use with environmental planning principles. The Plan examines the whole infrastructure system in order to outline a framework for planning subsequent projects and/or developments (Class EA, 2000)."

Hamilton

PHILIPS ENGINEERING

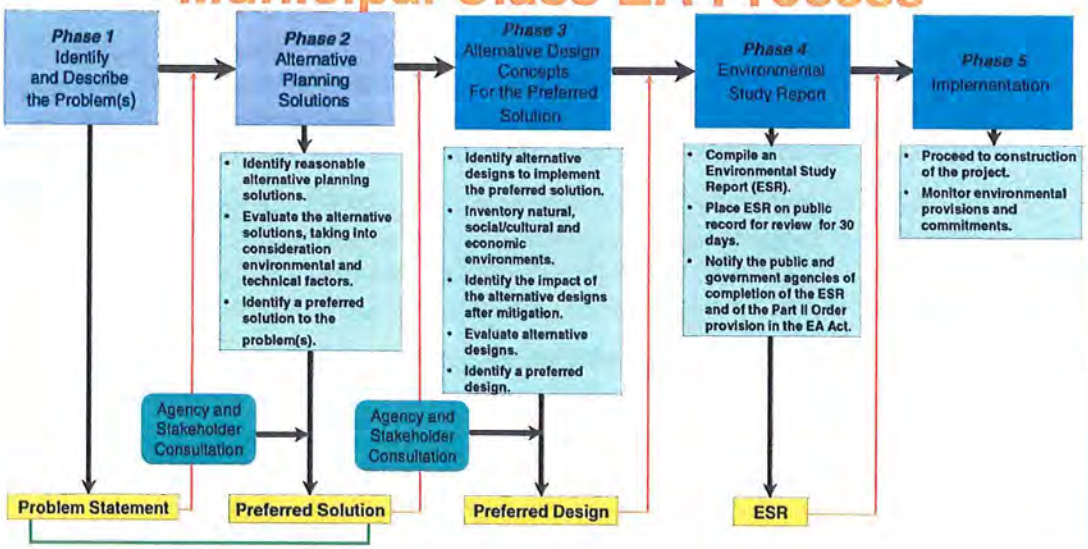
Municipal Class EA Process

- Master Servicing Plans have distinguishing features that set them apart from project specific studies. These features include the following:
  - Master Plans are broad in scope and focus on the analysis of a system for the purpose of outlining a framework for the provision of future works and developments.
  - Specific projects recommended in a Master Plan are part of a larger management system and are distributed geographically throughout the study area.
  - The implementation of specific projects occurs over an extended time frame.
- The Water and Wastewater Master Servicing Plan for SCUBE East will follow the Class Environmental Assessment process for Master Plans and will satisfy Phases 1 and 2 of the Class EA Process. As part of the process, public and agency consultation will be undertaken and detailed development and evaluation of alternative water and wastewater servicing strategies will be examined.

Hamilton

PHILIPS ENGINEERING

Municipal Class EA Process



The Master Plan Process will include Phases 1 and 2 of the Municipal Class EA Process.

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Background Information

- The City of Hamilton is in the process of preparing a Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area.
- The SCUBE area consists of the lands east of Fruitland Road, north of Highway No. 8 and south of Barton Street, including Winona; and the lands east of Winona, north of Highway No. 8, south of the QEW and west of the City limits. The study area consists of approximately 504 hectares (1245 acres) of land.
- The SCUBE – East is bounded by Winona Road, the South Service Road, the Municipal Boundary, the CNR tracks and a small section that extends to Barton Street (ref. Key Plan).
- Lands within the area have been redesignated from agricultural to development.
- As part of the Ontario Municipal Board settlement, development will be allowed to proceed ahead of the Secondary Plan.
- In order to proceed, servicing studies for water and wastewater are required.
- With the agreement of the City, land owners in the area have initiated the Water and Wastewater Master Servicing Plan.
- The completed Water and Wastewater Master Servicing Plan will form part of the Secondary Plan for the SCUBE area.

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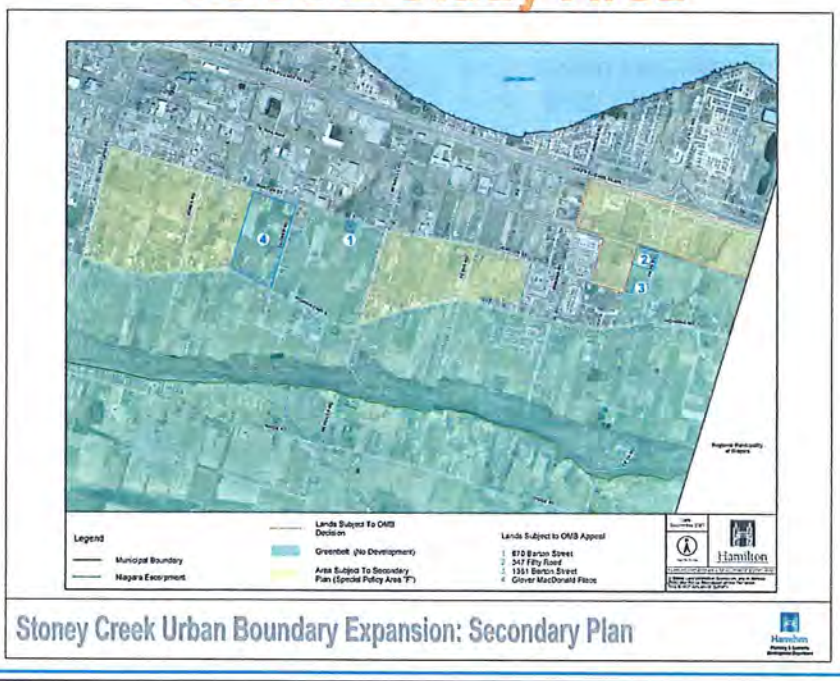
SCUBE Study Area



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Problem/Opportunity Statement

- The City of Hamilton has identified a need and/or opportunity to develop the Stoney Creek Urban Boundary Expansion (SCUBE) area and will prepare a Secondary Plan in 2008.
- Landowners in the SCUBE – East are prepared to initiate the development process immediately, and to accommodate this development, water and wastewater infrastructure extension will be required to service the area.
- Preparation of the Water and Wastewater Master Servicing Plan will proceed ahead of the City's schedule for preparation of the SCUBE Secondary Plan.
- This project is specifically related to water and wastewater. Stormwater Management will be reviewed under a different project.

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Existing Conditions

- 72 ha area approximately located at the QEW and Fifty Road interchange
- Generally bounded by the South Service Road to the north, the CNR Lands and Barton Street to the south, Winona Road to the west and the City Boundary to the east.

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PHILIPS ENGINEERING

Existing Conditions – Water System

- 300mm watermain on South Service Road, located west of Winona Road
- 300mm watermain on Winona Road, located between South Service Road and Service Road
- 200mm watermain on Winona Road, located between Service Road and Barton Street
- 200mm watermain on Service Road
- 200mm watermain on Sonoma Line
- 200mm watermain on Barton Street
- 500mm watermain on Barton Street

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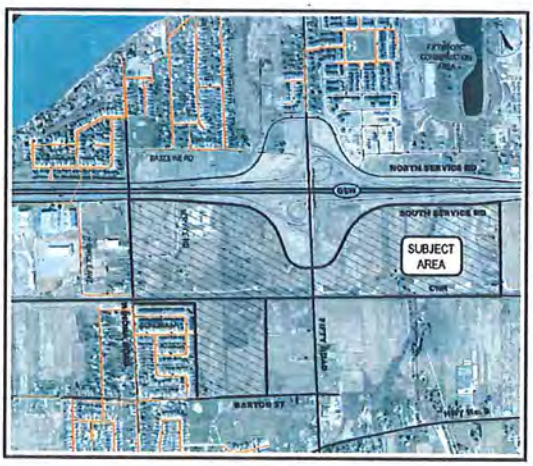
Existing Conditions – Wastewater System

- 1200mm sewer located in the South Service Road R.O.W. located 200m west of Winona Road at the Oriole Avenue Intersection
- 600mm sewer along Winona Road, flowing north towards Victoria Avenue and then west along Victoria Avenue to Oriole Avenue
- 250mm sewer along Sonoma Line
- 300mm sewer along Barton Street



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PHILIPS ENGINEERING

Water: Alternative Solution No. 1

- Extension of watermain on South Service Road from Winona Road east to Town of Grimsby boundary to service area south of South Service Road and north of CNR Lands.
- Extension of watermain on Sonoma Lane east and new connection to watermain on Barton Street to service area south of the CNR Lands and north of Barton Street.

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Water: Alternative Solution No. 2

- Extension of watermain on South Service Road from east of Fifty Road east to Town of Grimsby boundary to service area south of South Service Road, north of CNR Lands and east of Fifty Road.
- Connection to existing watermain on Fifty Road to service area south of South Service Road, north of CNR Lands and west of Fifty Road.
- New watermain along CNR Lands west connecting to watermain on Fifty Road to service area south of CNR Lands and north of Barton Street.

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PHILIPS ENGINEERING

Water: Alternative Solution No. 3

- Extension of watermain on South Service Road from east of Fifty Road east to Town of Grimsby boundary to service area south of South Service Road, north of CNR Lands and east of Fifty Road.
- New watermain along new easement connecting to existing watermain on Service Road to service area south of South Service Road, north of CNR Lands and west of Fifty Road.
- New watermain along CNR Lands, connecting to existing watermain on Winona Road to service area south of CNR Lands and north of Barton Street.

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Wastewater: Alternative Solution No. 1

- Extension of existing sewer on South Service Road from east of Oriole Avenue east to Town of Grimsby boundary with new Pump Station and Forcemain to service area south of South Service Road and north of CNR Lands.
- Extension of existing sewer on Sonoma Lane east and new connection to sewer on Barton Street to service area south of the CNR Lands and north of Barton Street.
- New sewer on Service Road connecting to proposed sewer extension on South Service Road.

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Wastewater: Alternative Solution No. 2

- Extension of existing sewer on South Service Road east to Winona Road.
- New sewer on Winona Road, connecting to proposed sewer extension on South Service Road and running south on Winona to CNR Lands.
- New sewer on CNR Lands with new Pump Station and Forcemain connecting to proposed sewer on Winona Road to service area south of South Service Road and north of CNR Lands.
- New sewer connecting to proposed sewer on CNR Lands, to service area south of CNR Lands and north of Barton Street.

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Wastewater: Alternative Solution No. 3

- Extension of existing sewer on South Service Road from east of Oriole Avenue east to Fifty Road to service area south of South Service Road, north of CNR Lands and west of Fifty Road.
- New sewer on CNR Lands with new Pump Station and Forcemain from Town of Grimsby boundary west connecting to new sewer on Fifty Road to service area south of South Service Road, north of CNR Lands and east of Fifty Road.
- New sewer on CNR Lands running east connecting to new sewer on Fifty Road, to service area south of CNR Lands and north of Barton Street.
- New sewer on Service Road connecting to proposed sewer extension on South Service Road.

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Evaluation Factors and Criteria

1. **Functional**
   - Effectiveness: Ability for the work to address the problem/concern and performance standards
2. **Environmental**
   - Impacts a proposed work would have on the terrestrial and aquatic environment
3. **Social**
   - Development Constraints/Opportunity: Impact on the work on the ability to develop new or existing lands
4. **Economic**
   - Capital Cost: Cost to design and implement associated works
   - Operational Cost: Cost associated with long term operation and maintenance work

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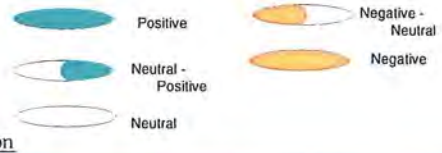
Evaluation Matrix - Water

Alternative Assessment and Screening				
Evaluation Category	**Evaluation Criteria**	**Alternative 1**	**Alternative 2**	**Alternative 3**
Functional Effectiveness	Effectiveness			
Environmental	Terrestrial and Aquatic			
Social	Development Constraints/ Opportunity			
Economic	Capital Cost			
	Operational Cost			
Alternative Ranking		1	3	2



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Preferred Alternative – Water

The Preferred is Alternative 1 for the following reasons:

- Alternative 1 is consistent with Alternative 2 and 3 for:
  - » Functional Effectiveness – Effectiveness;
  - » Environmental – Terrestrial and Aquatic, and
  - » Social – Development Constraints/Opportunity.
- Alternative 1 is preferred over Alternative 2 and 3 for economic and operational reasons as the watermains are located within existing rights-of-way controlled by the City (i.e. no cost for easements).
- Alternative 1 is preferred over Alternative 2 and 3 for economic and operational reasons as the watermain is the natural extension to existing watermains.

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Evaluation Matrix - Wastewater

Alternative Assessment and Screening				
Evaluation Category	Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
Functional Effectiveness	Effectiveness			
Environmental	Terrestrial and Aquatic			
Social	Development Constraints/ Opportunity			
Economic	Capital Cost			
	Operational Cost			
Alternative Ranking		1	2	2

Positive

Neutral - Positive

Neutral

Negative - Neutral

Negative

Hamilton

PHILIPS ENGINEERING

Preferred Alternative - Wastewater

The Preferred is Alternative 1 for the following reasons:

- Alternative 1 is consistent with Alternative 2 and 3 for:
  - » Functional Effectiveness – Effectiveness;
  - » Environmental – Terrestrial and Aquatic, and
  - » Social – Development Constraints/Opportunity.
- Alternative 1 is preferred over Alternative 2 and 3 for economic and operational reasons as the systems are located within existing rights-of-way controlled by the City (i.e. no cost for easements).
- Alternative 1 is preferred over Alternative 2 and 3 for economic and operational reasons as the system is a natural extension to existing wastewater infrastructure.

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Next Steps

- Receive public comments by January 3, 2007;
- Review and confirm the results of the data collection and preliminary analysis;
- Review comments on problem identification for water and wastewater;
- Develop alternative solutions for water and wastewater;
- Complete detailed impact analysis;
- Develop proposals for mitigation of negative effects;
- Master Planning Document, and
- Council approval of EA prior to filing of the Master Servicing Plan for the 30-day review period.

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How to Provide Your Comments

- Complete a comment sheet
- By Mail
- By Phone
- By Fax
- By e-mail psmeltzer@philipseng.com or uehrenbe@hamilton.ca

Thank you for your Participation!

Hamilton

PHILIPS ENGINEERING

Hamilton

PUBLIC INFORMATION CENTRE No.2

Thursday, December 13, 2007
Stoney Creek Municipal Building

COMMENT SHEET

PROJECT: **Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion - East**

PLEASE PRINT

NAME: Andrew Roxburgh

E-mail: andyroxburgh@hotmail.com

(Number & Street) 804 Barton St.

(Municipality) Stoney Creek

(Postal Code) L8E 5G6

Comments:

- It's information meeting should have been publicized by SCUBE planners

- please ensure communication to all dept throughout the process & keep costs as low as possible

Please send your comments by to Thursday January 3, 2008:

Paul Smeltzer, P.Eng.
Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington, Ontario
L7R 3Y2
Ph. 905-335-2353 ext. 1283
Fax 905-335-1414
E-mail psmeltzer@philipseng.com

Udo Ehrenberg P. Eng.
Project Manager
City of Hamilton
Plant Capital and Planning
Public Works Department
55 John Street North, 6th Floor
Hamilton, ON L8R 3M8
Ph. (905) 546-2424 ext. 2499
Fax (905) 546-4491
E-mail uehrenbe@hamilton.ca

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PUBLIC INFORMATION CENTRE No.2

Thursday, December 13, 2007
Stoney Creek Municipal Building

COMMENT SHEET

PROJECT: **Water and Wastewater Master Servicing Plan for the Stoney Creek Urban Boundary Expansion - East**

PLEASE PRINT

NAME: G. BEATTIE

E-mail: 905-643-3834

(Number & Street) P.O. Box 10002

(Municipality) WINONA ON

(Postal Code) L8E 5R1

Comments:

Water Main on Fifty Road (Hwy. 8 to Barton) is old and in need of repair. When will this be done so as not to repeat the breaking that occurred in Oct/Nov. 2007 (1/2 way along)

How many repair jobs have there been in this area of pipe in the last 10 years?

Please notify me when this Plan goes to Public Works Committee. Thank you.

Please send your comments by to Thursday January 3, 2008:

Paul Smeltzer, P.Eng.
Project Manager
Philips Engineering Ltd.
3215 North Service Road, Box 220
Burlington, Ontario
L7R 3Y2
Ph. 905-335-2353 ext. 1283
Fax 905-335-1414
E-mail psmeltzer@philipseng.com

Udo Ehrenberg P. Eng.
Project Manager
City of Hamilton
Plant Capital and Planning
Public Works Department
55 John Street North, 6th Floor
Hamilton, ON L8R 3M8
Ph. (905) 546-2424 ext. 2499
Fax (905) 546-4491
E-mail uehrenbe@hamilton.ca

Indian and Northern Affairs Canada
www.inac.gc.ca

Affaires indiennes et du Nord Canada
www.ainc.gc.ca

Your file - Votre référence

DEC 19 2007

Our file - Notre référence

Paul D. Smeltzer
Philips Engineering
3215 North Service Road, Box 220
BURLINGTON ON L7R 3Y2

Dear Mr. Smeltzer:

Re: Notice of Study Commencement and
Public Information Centre
Water and Wastewater Master Servicing Plan
For the Stoney Creek Urban Boundary Expansion - East

I am writing in response to your letter of October 19, 2007, addressed to Mr. Franklin Roy inquiring about any claims that may affect the subject property. I regret that we were unable to respond earlier.

We can advise that our inventory does not include active litigation in the vicinity of this property. Please note that we are unable to make any representations regarding potential or future claims.

We cannot make any comments regarding claims filed under other departmental policies. For information on any claims you should also contact Lyle Henderson of the Specific Claims Branch at (819) 953-3192 to inquire about any Specific Claims, and Guy Morin of the Comprehensive Claims Branch at (819) 956-0325 to inquire about any current Comprehensive Claims.

Canada

If you have any further questions please do not hesitate to contact me at (819)956-3181.

Sincerely,

Jonathan Allen
A/Litigation Team Leader
Litigation Portfolio Operations East
Litigation Management and Resolution Branch

APPENDIX B

DETAILED ANALYSIS PREPARED BY HATCH MOTT MACDONALD

Hatch Mott MacDonald

TECHNICAL MEMORANDUM

To	**Paul Smeltzer, P.Eng.**
From	HMM
Date	July 17, 2008
Project #	239861
Page	1 of 14
CC	
Subject	**SCUBE EAST - WATER DISTIBUTION AND WASTEWATER COLLECTION SYSTEM MODELLING (REVISED)**

1.0 INTRODUCTION

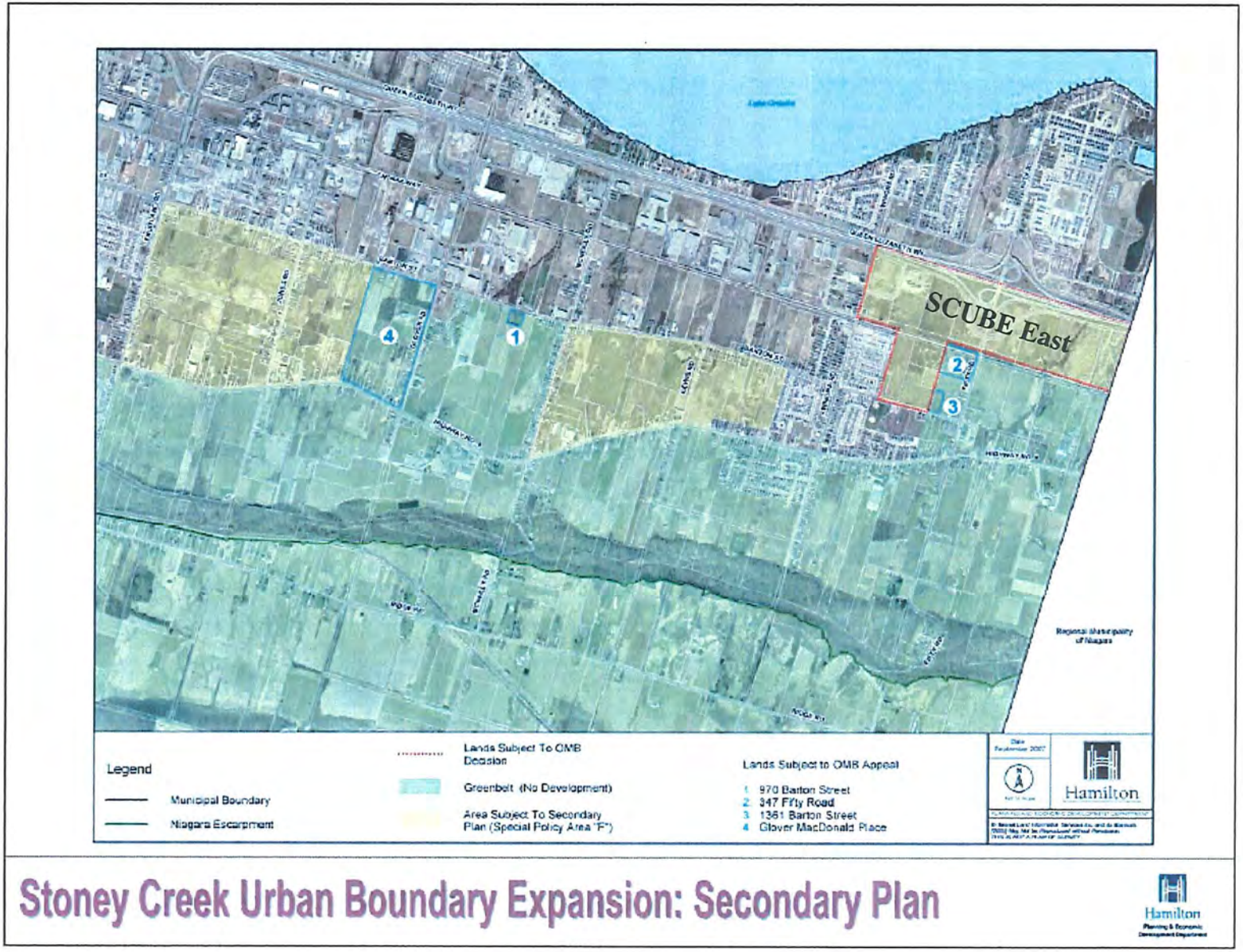
The City of Hamilton is in the process of preparing a Secondary Plan for the Stoney Creek Urban Boundary Expansion (SCUBE) area, which includes the lands east of Fruitland Road, north of Highway #8 and south of Barton Street, including Winona; and the lands east of Winona, north of Highway #8, south of the QEW and west of the City limits; and comprising approximately 504 hectares. The SCUBE East area is bounded by Winona Road, the South Service Road, the Hamilton/Grimsby boundary, the CNR tracks, and a small area that extends south to Barton Street between Winona Road and Fifty Road. The boundaries of the SCUBE and SCUBE East areas are shown in Figure 1-1.

Lands within the SCUBE East area have been have been re-designated from agricultural to commercial use, and as part of an Ontario Municipal Board settlement, development will be allowed to proceed ahead of the completion of the Secondary Plan, provided that a Water and Wastewater Master Servicing Plan is completed, to form part of the Secondary Plan for the SCUBE area.

In support of their preparation of a new Water and Wastewater Master Servicing Plan for SCUBE East, Philips Engineering Ltd. (Philips) requested the services of Hatch Mott MacDonald (HMM) to complete hydraulic modeling of the proposed water distribution and wastewater collection systems in SCUBE East, to confirm the adequacy, and/or propose additional improvements that may be required, to service the proposed developments in SCUBE East. The scope of work included updating the existing hydraulic models of Hamilton's water distribution and wastewater collection systems to incorporate the additional water and sewage flows from the proposed developments in SCUBE East, along with any planned system

Hatch Mott MacDonald
5420 North Service Road Unit 200 Burlington ON L7L 6C7 T •905-315-3509 • F 905-315-3569
www.hatchmott.com

Figure 1-1: Stoney Creek Urban Boundary Expansion (SCUBE) Study Area



improvements, and then running the hydraulic models under various operating scenarios to confirm the adequacy, and/or propose additional improvements that may be required, to service the proposed developments in SCUBE East. The future water demands and sewage flows were determined by Philips based on the proposed development densities and provided to HMM.

This Technical Memorandum summarizes the methodology and results of the water distribution and wastewater collection system analyses, and confirms the adequacy of the City's water distribution and wastewater collection systems (with proposed improvements) to service the proposed developments in SCUBE East.

2.0 WATER DISTRIBUTION SYSTEM MODELLING

Previous studies have indicated that the existing water distribution system in the Stoney Creek east area is capable of supplying the current needs of the community, provided some additional reinforcement is added. Specifically, the water distribution system in the Stoney Creek East area requires redundancy in the event of failure of the crossing(s) of the QEW. A previous study indicated that the development of SCUBE East presents an opportunity to build reinforcement. In 2007, the City completed one of the recommended projects, with the installation of a 400 mm diameter watermain on Fifty Road from Barton Street to the North Service Road to connect the north and south sides of Stoney Creek East. An analysis of the impact of the proposed development of SCUBE East is required to determine if the addition of these new water demands can be accommodated by the planned water distribution system improvements.

2.1 Methodology

The projected demands for the SCUBE East development area were developed based on the unit water demand criteria from the City of Hamilton Water and Wastewater Master Plan Class Environmental Assessment Report by KMK Consultants Limited, November 2006. Table 2-1 provides a summary of these criteria.

Table 2-1: Unit Water Demand Criteria

Criteria	Value
Average Day Residential Consumption	360 Lpcd
Average Day Employment Consumption	260 L/employee/d
Maximum Day Factor	2.0
Peak Hour Factor	3.0

Table 2-2 provides a summary of the proposed water demands for the SCUBE East development area based on developable area and proposed development densities.

Table 2-2: SCUBE East Water Demands

Criteria	Value	Area	Density Range		Demand	
Average Day Residential Consumption	360 Lpcd	153.73 ha	57	98 ppha	3.15 ML/d	5.42 ML/d
Average Day Employment Consumption	260 L/employee/d	62.88 ha	34	79 jobs/ha	0.56 ML/d	1.29 ML/d

In order to thoroughly assess the potential impacts of servicing the SCUBE East development area, the updated water distribution system was evaluated under the following water demand conditions/scenarios:

- Average Daily Flow (Existing, 2011, 2021, 2031);
- Maximum Daily Flow (Existing, 2011, 2021, 2031);
- Peak Hourly Flow(Existing, 2011, 2021, 2031);
- Max Daily Flow plus Fire Flow (Existing, 2011, 2021, 2031).

Fire flow requirements for the proposed development areas were calculated in accordance with Part II - Guide for Determination of Required Fire Flow of Fire Underwriter's Survey - Water Supply for Public Fire Protection – 1999. Detailed fire flow calculations are provided in Appendix A.

Hydraulic modeling of the water distribution system was conducted to demonstrate that Hamilton's existing water distribution system is sufficient to accommodate the development in SCUBE East area. HMM obtained a working copy of the WaterCAD hydraulic model of the City's water distribution system, which was recently updated and used by KMK in the preparation of the Master Water Servicing Plans for the City of Hamilton and South Waterdown. We then revised/extended the existing WaterCAD model to include the following additional components:

- Existing 400mm watermain on Fifty Road from Barton Street (500mm watermain) to North Service Road (300mm watermain);
- Existing 200mm watermain on Service Road from Winona Road (200mm watermain) to End;
- Existing 200mm watermain on Sonoma Lane from Winona Road (300mm watermain) to End;
- Existing 200mm watermain on Napa Lane from Barton Street (200mm watermain) to Sonoma Lane (200mm);
- Existing 200mm watermain on Benziger Lane from Barton Street (300mm watermain) to Sonoma Lane;
- Existing 150mm watermain on Benziger Lane from Napa Lane to Sonoma Lane.
- Proposed 300mm watermain on South Service Road from the existing 200mm watermain on Service Road to the existing 400mm watermain on Fifty Road.
- Proposed 200mm watermain on South Service Road from the existing 400mm to approximately 180m east.

Figure 2-1 shows the location of the proposed watermains in the SCUBE East development area.

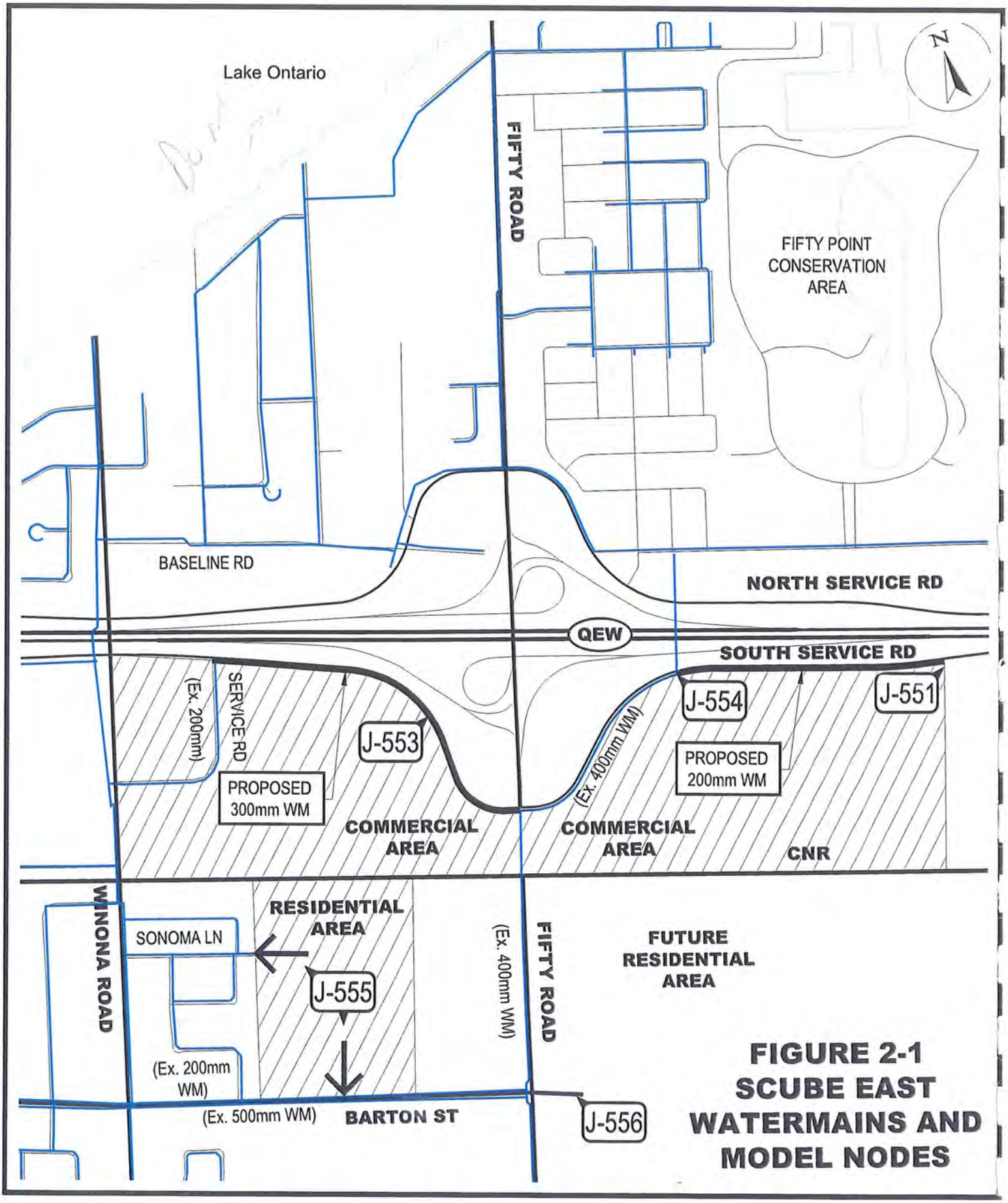


FIGURE 2-1
SCUBE EAST WATERMAINS AND MODEL NODES

The analysis was completed using the updated WaterCAD hydraulic model of the existing water distribution system, which was revised to include all of the proposed (future) water demands for the build-out of the SCUBE East development area. In order to assess the 'worst case' scenario for the existing water system, the demands utilized in this analysis were based on the maximum development density (79 jobs/ha for commercial and 98 ppha for residential) as presented in Table 2-2. These demands were added to the model and distributed between four (4) new model nodes (See Figure 2-1) as summarized in Table 2-3.

Table 2-3: Model Water Demands

Model Node	Avg. Day Demand	Max. Day Demand	Peak Hour Demand
J-555	5.90 L/s	11.21 L/s	17.70 L/s
J-553	7.95 L/s	15.11 L/s	23.86 L/s
J-554	7.00 L/s	13.29 L/s	20.99 L/s
J-556	56.78 L/s	108.06 L/s	170.62 L/s
Total	**77.63 L/s**	**147.67 L/s**	**233.17 L/s**

The fire flow analysis was completed using the WaterCAD model as revised above, and by applying a residential fire flow demand of 85 L/s to nodes J-555 and J-556, and a commercial fire flow demand of 205 L/s to nodes J-553 and J-554. All fire flows are conducted with a minimum pressure constraint of 20 psi for residual pressure.

2.2 Results

Tables 2-4 through 2-7 present the results of our hydraulic analysis, for all of the different scenarios tested. The results of our analysis indicate that the proposed water demands and fire flows for the SCUBE East development area can be provided by the existing water distribution system. Two key factors were examined to assess the impact of the proposed development on the existing water system;

pressure and maximum pipe velocity in the local distribution system. With regard to system pressures, there are two key minimum pressure constraints that should be maintained in the system; 40 psi during peak hour demands, and 20 psi during fire flow events. Our analysis indicates that these minimum pressures can be maintained through the existing water distribution system. With regard to maximum pipe velocity, a maximum target velocity of 2.74 m/s (9 ft/s) was selected for this analysis. Our results indicate that the maximum velocity in the existing distribution system and proposed watermains under maximum day plus fire flow conditions will not exceed this threshold.

Table 2-4: Current Year (Existing) Modeling Results

Model Node	Avg. Day Node Pressure	Max. Day Node Pressure	Peak Hour Node Pressure	Available Fire Flow
J-555 (Residential)	62.2 psi	58.7 psi	54.4 psi	> 85 L/s
J-553 (Commercial)	69.9 psi	66.7 psi	61.4 psi	> 205 L/s
J-554 (Commercial)	69.9 psi	66.7 psi	61.4 psi	> 205 L/s
J-556 (Residential)	59.1 psi	55.3 psi	50.5 psi	> 85 L/s
J-551 (Commercial)	72.7 psi	69.0 psi	64.3 psi	180 L/s (V>9.0 ft/s in 200mm)
Max. Pipe Velocity in Area	< 0.46 m/s (< 1.5 ft/s)	< 0.61 m/s (<2.0 ft/s)	< 0.91 m/s (< 3.0 ft/s)	< 2.44 m/s (<8.0 ft/s)

Note: Results based on two (2) High Lift Pumps operated at the Woodward Ave WTP.

Table 2-5: 2011 Development Year Modeling Results

Model Node	Avg. Day Node Pressure	Max. Day Node Pressure	Peak Hour Node Pressure	Available Fire Flow
J-555 (Residential)	62.0 psi	58.3 psi	53.5 psi	> 85 L/s
J-553 (Commercial)	69.7 psi	65.7 psi	60.5 psi	> 205 L/s
J-554 (Commercial)	69.7 psi	65.7 psi	60.5 psi	> 205 L/s
J-556 (Residential)	58.9 psi	54.9 psi	49.5 psi	> 85 L/s
J-551 (Commercial)	72.5 psi	68.6 psi	63.4 psi	180 L/s (V>9.0 ft/s in 200mm)
Max. Pipe Velocity in Area	< 0.46 m/s (< 1.5 ft/s)	< 0.61 m/s (<2.0 ft/s)	< 0.91 m/s (< 3.0 ft/s)	< 2.44 m/s (<8.0 ft/s)

Note: Results based on two (2) High Lift Pumps operated at the Woodward Ave WTP.

Table 2-6: 2021 Development Year Modeling Results

Model Node	Avg. Day Node Pressure	Max. Day Node Pressure	Peak Hour Node Pressure	Available Fire Flow
J-555 (Residential)	61.5 psi	59.0 psi	51.4 psi	> 85 L/s
J-553 (Commercial)	69.2 psi	66.4 psi	58.2 psi	> 205 L/s
J-554 (Commercial)	69.2 psi	66.4 psi	58.2 psi	> 205 L/s
J-556 (Residential)	58.4 psi	55.6 psi	47.3 psi	> 85 L/s
J-551 (Commercial)	72.1 psi	69.2 psi	61.1 psi	180 L/s (V>9.0 ft/s in 200mm)
Max. Pipe Velocity in Area	< 0.46 m/s (< 1.5 ft/s)	< 0.61 m/s (<2.0 ft/s)	< 0.91 m/s (< 3.0 ft/s)	< 2.44 m/s (<8.0 ft/s)

Note: Results based on two (2) High Lift Pumps operated at the Woodward Ave WTP for Average Day and three (3) High Lift Pumps for Maximum Day and Peak Hour.

Table 2-7: 2031 Development Year Modeling Results

Model Node	Avg. Day Node Pressure	Max. Day Node Pressure	Peak Hour Node Pressure	Available Fire Flow
J-555 (Residential)	61.0 psi	57.6 psi	50.7 psi	> 85 L/s
J-553 (Commercial)	68.7 psi	64.9 psi	57.5 psi	> 205 L/s
J-554 (Commercial)	68.7 psi	64.9 psi	57.5 psi	> 205 L/s
J-556 (Residential)	57.9 psi	54.0 psi	46.5 psi	> 85 L/s
J-551 (Commercial)	71.5 psi	67.7 psi	60.3 psi	175 L/s (V>9.0 ft/s in 200mm)
Max. Pipe Velocity in Area	< 0.46 m/s (< 1.5 ft/s)	< 0.61 m/s (<2.0 ft/s)	< 0.91 m/s (< 3.0 ft/s)	< 2.44 m/s (<8.0 ft/s)

Note: Results based on three (3) High Lift Pumps operated at the Woodward Ave WTP.

2.3 Conclusions

The results of the water distribution system analysis confirm that the existing water distribution system and proposed watermain improvements are sufficient to meet the anticipated servicing and fire flow requirements for the SCUBE East development area.

3.0 WASTEWATER COLLECTION SYSTEM MODELLING

The preferred solution identified by Philips for wastewater servicing for the SCUBE East development includes the following components:

- New sanitary sewers along the South Service Road, from just east of Oriole Avenue to the Town of Grimsby boundary. Depending upon the required sewer elevations and topography, the upstream portion(s) of the new sewers may include a new sewage pumping station and forcemain to service the area south of the South Service Road and north of the CNR lands.
- New sanitary sewer at the east end of Sonoma Lane, east of Benziger Lane.

- New sanitary sewer on north side of Barton Street, east of Napa Lane.

Hydraulic modelling of the existing wastewater collection system and proposed SCUBE East services, using MOUSE, is required to address three key issues.

1) Computer modelling is required to confirm the ability of the existing sanitary sewer system to accommodate additional sewage flows from SCUBE East and to identify any improvements to the existing system that may be required (if any) to reliably service the new development.
2) Computer modelling is required to determine the potential impact (if any) of additional sewage flows from SCUBE East on the Eastern Sanitary Interceptor (ESI) sewer, including consideration of the operation of the wet well at the Woodward Avenue WWTP. This requires the establishment of a hydraulic grade line in the ESI for the proposed development scenarios, for selected dry and wet weather flow scenarios and different wet well operating scenarios.
3) Computer modelling is required to assist in the design of new sanitary sewers to service SCUBE East, and determining the need for and sizing of a possible future sewage pumping station and forcemain for the Fifty Road area (if required).

3.1 Methodology

The existing MOUSE model of the Hamilton Trunk Sanitary Sewer System (TSSS) provided by the City was updated and employed to confirm the hydraulic conveyance capacity of the Eastern Sanitary Interceptor (ESI) Sewer and its ability to accommodate the sanitary sewage flows from the proposed developments in the SCUBE East area during both dry and wet weather.

The following sanitary sewers (and manholes) were added to the existing MOUSE model to connect the SCUBE East development:

- Existing 250 mm sewers along Sonoma Lane from Benziger Lane to Winona Road (from MH SN04A051 to MH SN04A010).

4) Rainfall time series were created and added to the new model, to permit analysis of the performance of the Stoney Creek TSSS and ESI for the City's 5-year design storm (total rainfall volume = 71.7 mm), and for the historical rainfall event of November 30 and December 1, 2006 (total rainfall volume = 78.6 mm).
5) Downstream boundary conditions for the Woodward Avenue WWTP Wet Well were input to the new model to permit analysis of the impact of wet well level on the performance of the Stoney Creek TSSS and ESI and the impact of the proposed SCUBE East development on the wet well level (if any).

The new MOUSE model of the Stoney Creek TSSS and ESI was then run for the following flow scenarios:

1) Maximum peak sanitary flow from SCUBE East (from Table 3-1) plus ultimate (2031) sanitary flows from WWMP for remaining drainage areas, for dry weather flow conditions, with a Woodward WWTP wet well level of 66 m.
2) Minimum peak sanitary flow from SCUBE East (from Table 3-2) plus ultimate (2031) sanitary flows from WWMP for remaining drainage areas, for dry weather flow conditions, with a Woodward WWTP wet well level of 66 m.
3) Maximum peak sanitary flow from SCUBE East (from Table 3-1) plus ultimate (2031) sanitary flows from WWMP for remaining drainage areas, for the City's 5-year design storm, with a Woodward WWTP wet well level of 66 m.
4) Minimum peak sanitary flow from SCUBE East (from Table 3-2) plus ultimate (2031) sanitary flows from WWMP for remaining drainage areas, for the City's 5-year design storm, with a Woodward WWTP wet well level of 66 m.
5) Maximum peak sanitary flow from SCUBE East (from Table 3-1) plus ultimate (2031) sanitary flows from WWMP for remaining drainage areas, for the storm event of November 30 and December 1, 2006, using the actual time series of observed Woodward WWTP wet well levels

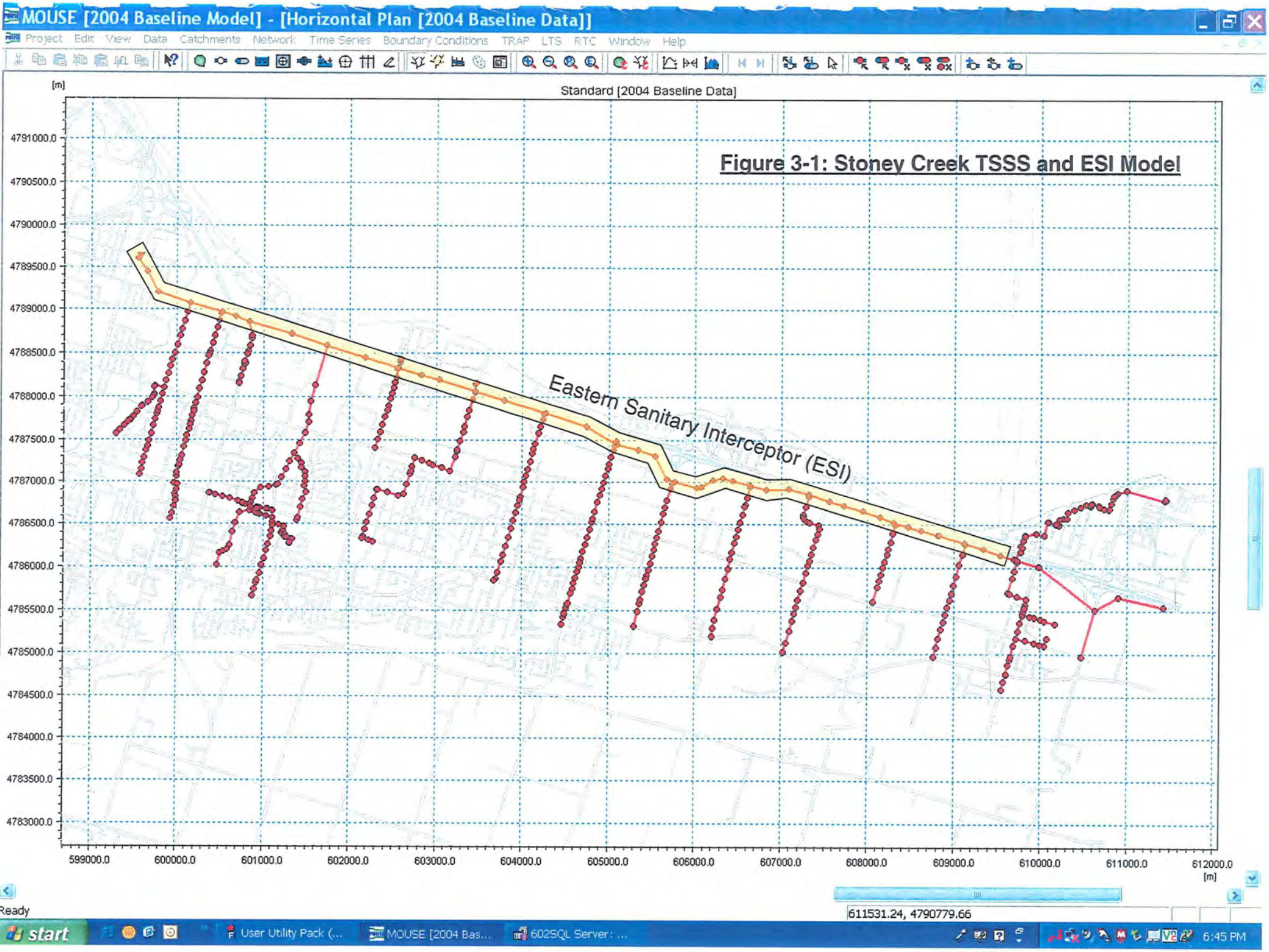

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Figure 3-1: Stoney Creek TSSS and ESI Model
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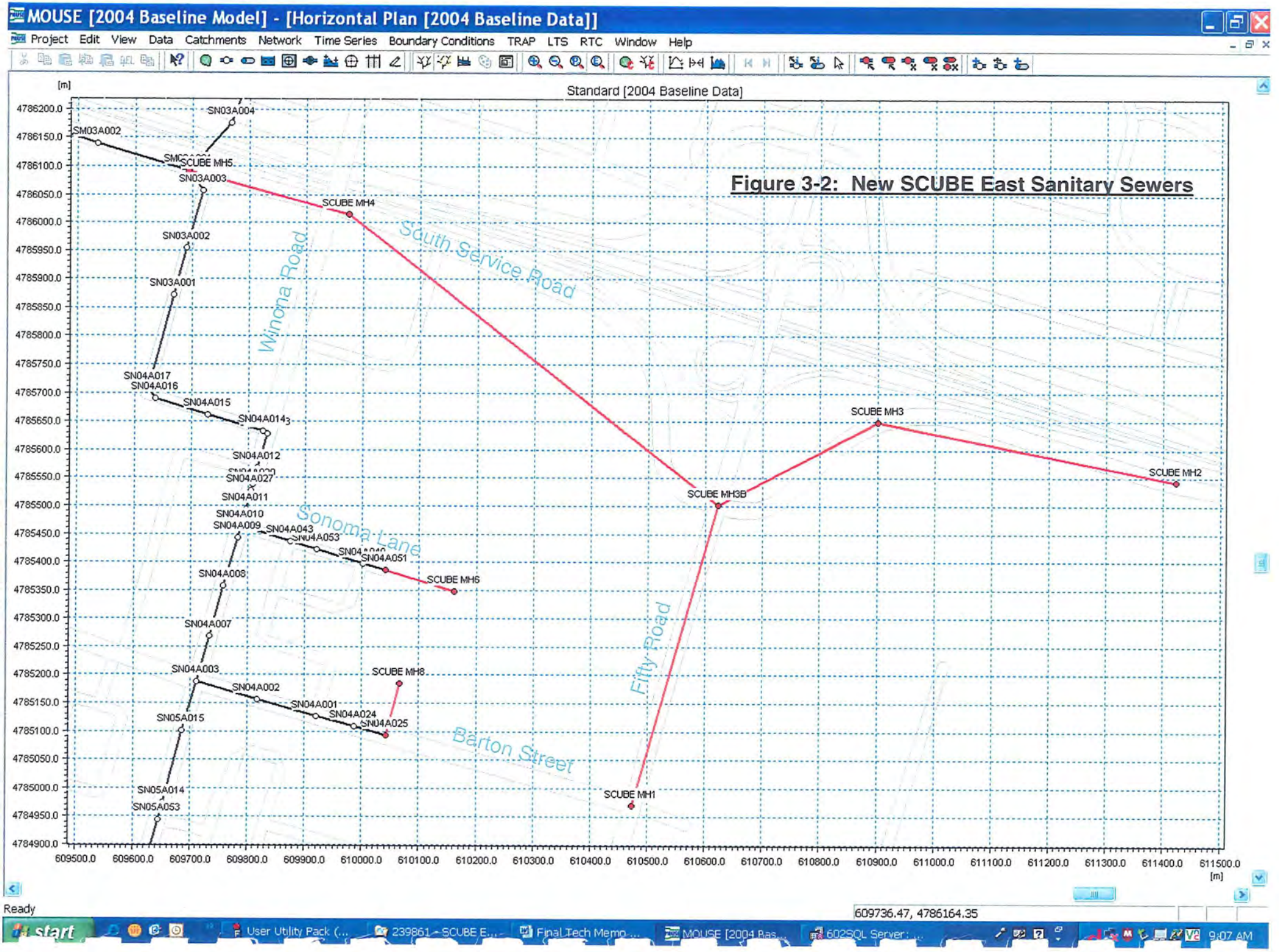
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Standard [2004 Baseline Data]
[m]
Figure 3-2: New SCUBE East Sanitary Sewers
SM03A002
SN03A004
SCUBE MH5
SN03A003
SCUBE MH4
SN03A002
SN03A001
Winona Road
South Service Road
SN04A017
SN04A016
SN04A015
SN04A014
SN04A012
SN04A027
SN04A011
SN04A010
SN04A009
SN04A043
SN04A053
SN04A051
SCUBE MH6
Sonoma Lane
SCUBE MH3
SCUBE MH2
SCUBE MH3B
SN04A008
SN04A007
SN04A003
SN04A002
SN04A001
SN04A024
SN04A025
SCUBE MH8
SN05A015
Barton Street
Fifty Road
SCUBE MH1
SN05A014
SN05A053
609500.0 609600.0 609700.0 609800.0 609900.0 610000.0 610100.0 610200.0 610300.0 610400.0 610500.0 610600.0 610700.0 610800.0 610900.0 611000.0 611100.0 611200.0 611300.0 611400.0 611500.0
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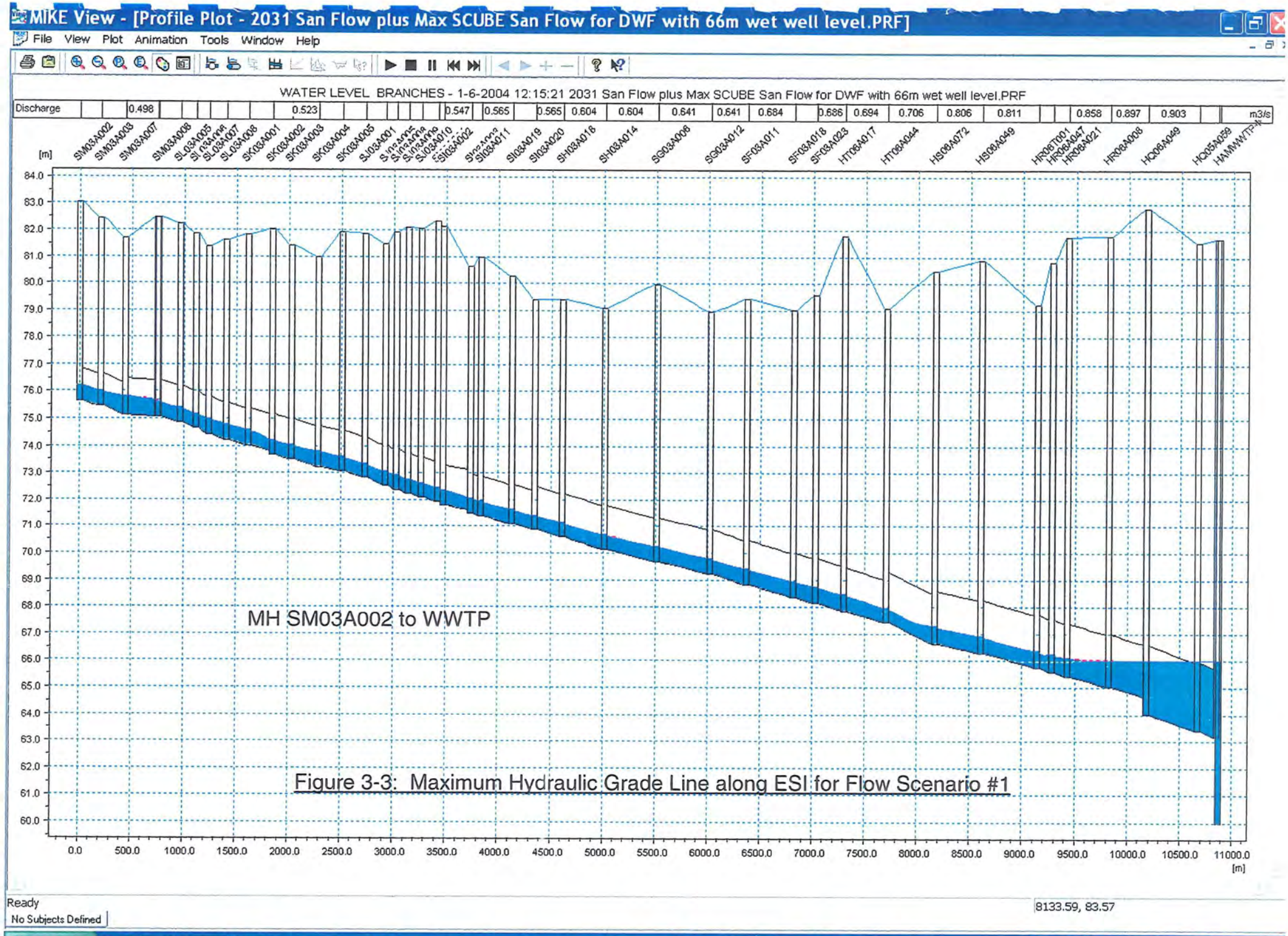


Figure 3-3: Maximum Hydraulic Grade Line along ESI for Flow Scenario #1

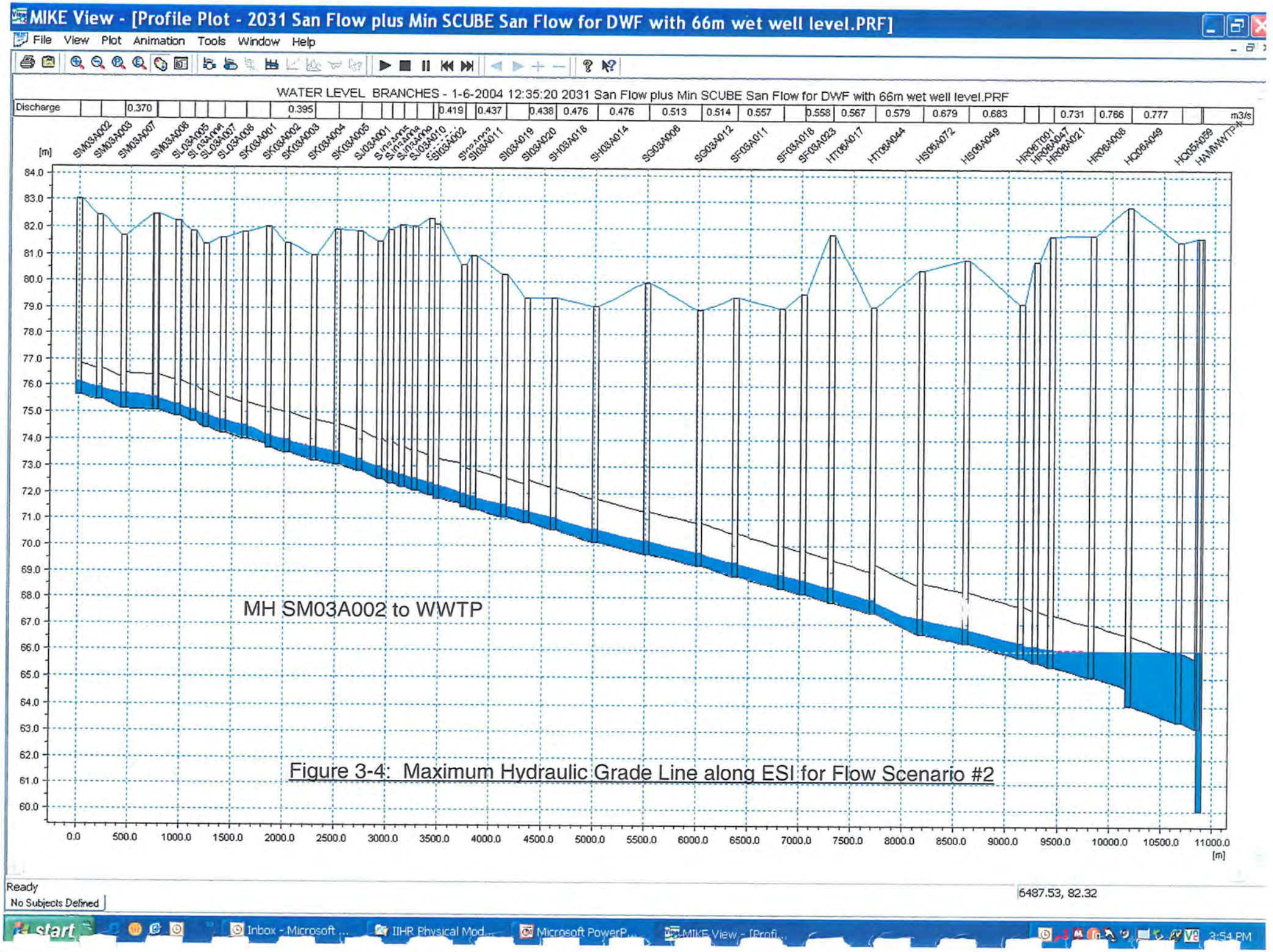


Figure 3-4: Maximum Hydraulic Grade Line along ESI for Flow Scenario #2

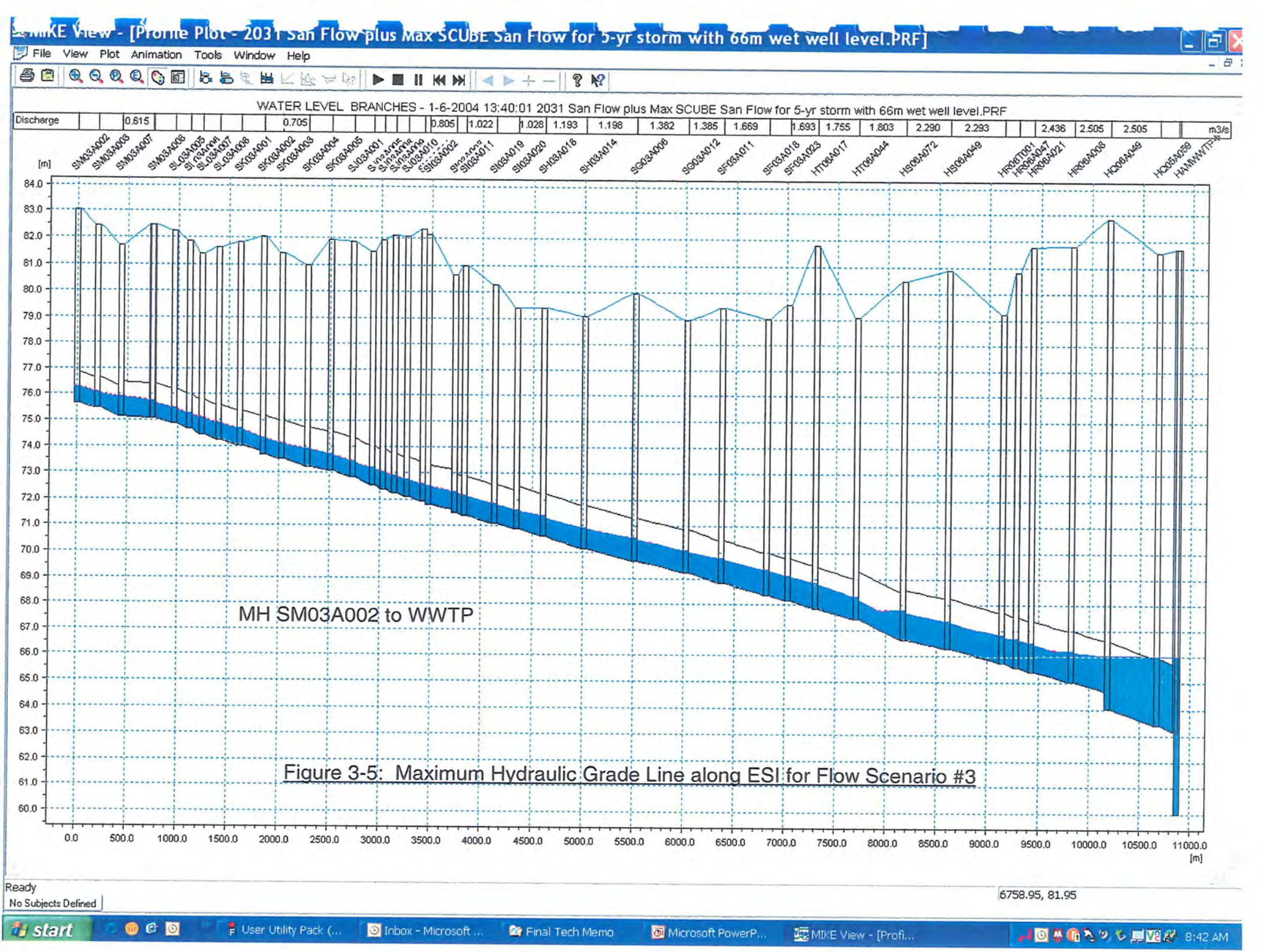


Figure 3-5: Maximum Hydraulic Grade Line along ESI for Flow Scenario #3

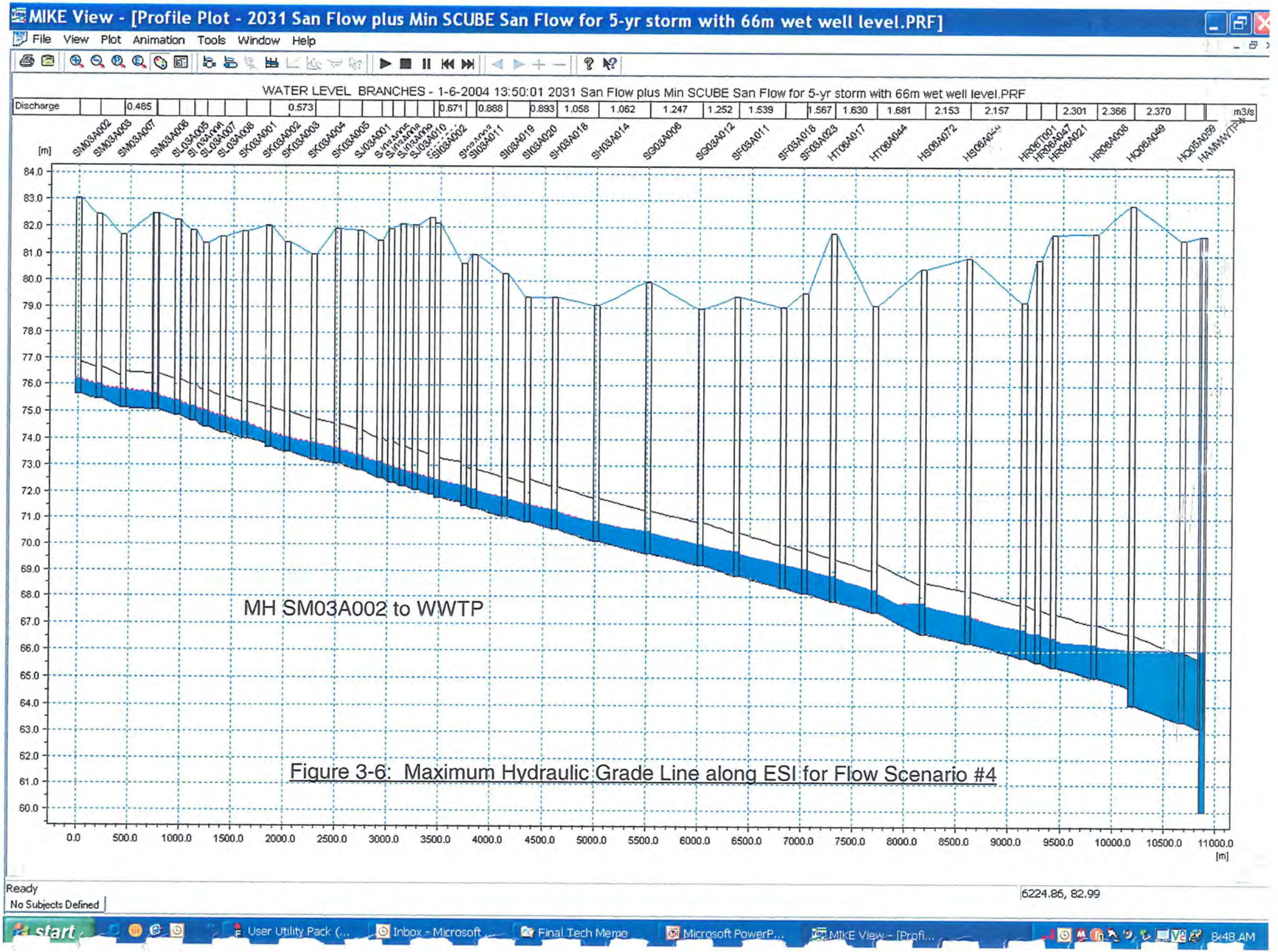


Figure 3-6: Maximum Hydraulic Grade Line along ESI for Flow Scenario #4

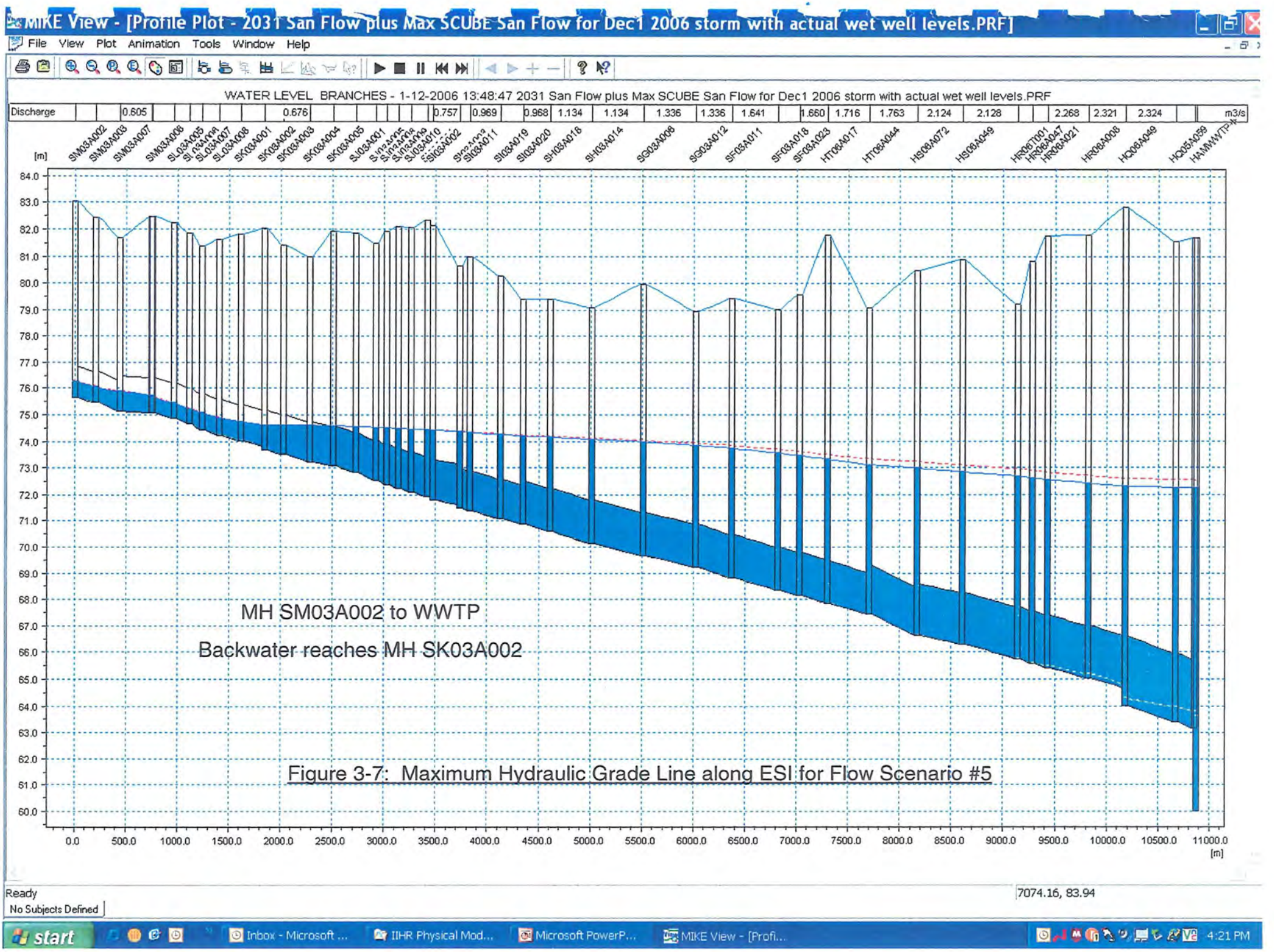
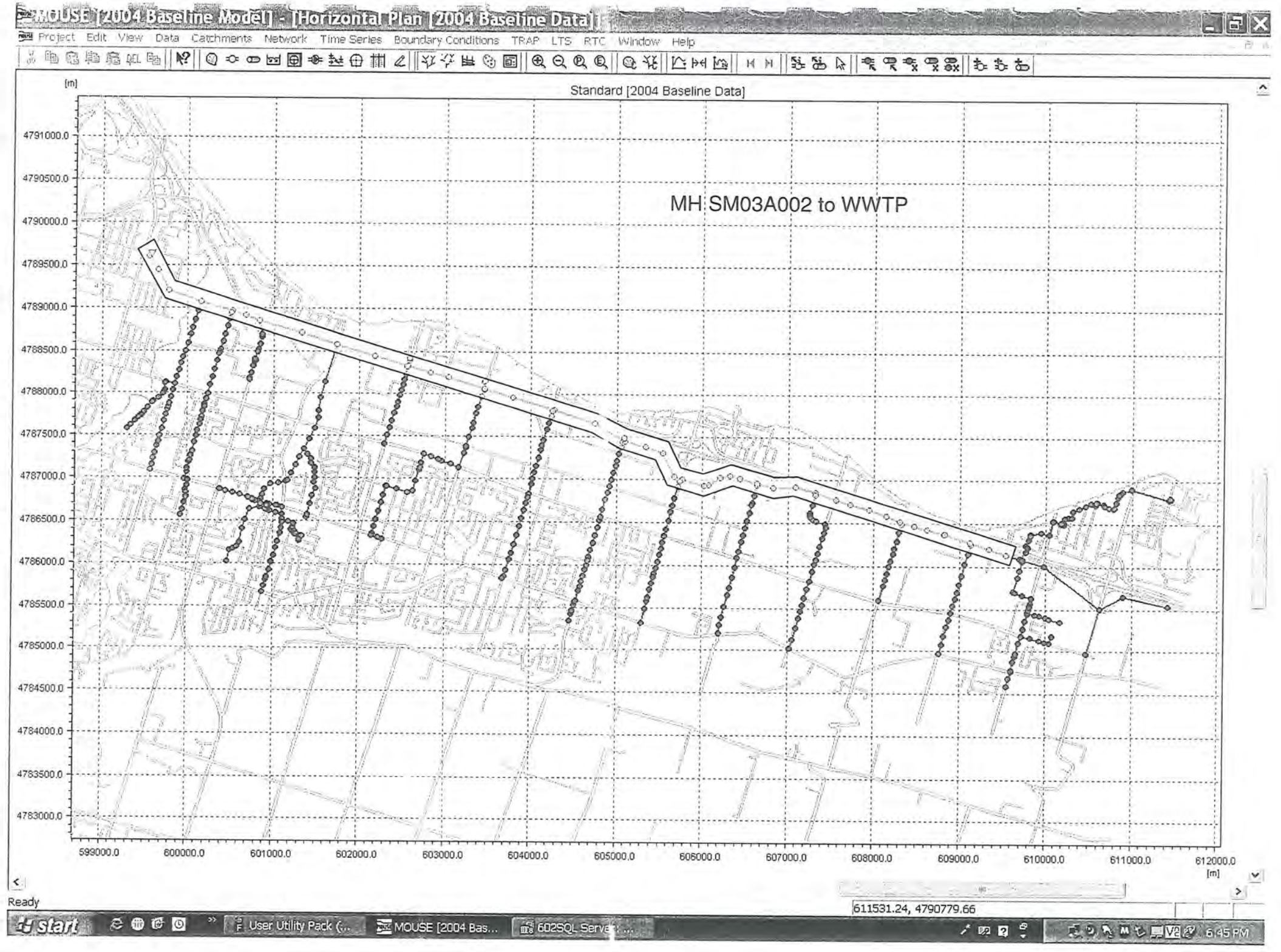


Figure 3-7: Maximum Hydraulic Grade Line along ESI for Flow Scenario #5

Table 3-3: Wastewater Collection System Modelling Results

Flow Scenario	Description of Flow Scenario	Maximum Flow from SCUBE East Area (L/s)	Hydraulic Capacity of ESI at MH SM03A001 (L/s)	Spare Capacity of ESI at MH SM03A001 (L/s)	Maximum Extent of Backwater from Wet Well
#1	Maximum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for DWF conditions, with a wet well level of 66m	490	1,233	60.3%	to MH HR06A008, near downstream end of ESI, approx. 860 m u/s of WWTP
#2	Minimum Peak Sanitary Flow from SCUBE East (from Table 3-2) plus 2031 sanitary flows for remaining drainage areas, for DWF conditions, with a wet well level of 66m	363	1,233	70.6%	to MH HR06A008, near downstream end of ESI, approx. 860 m u/s of WWTP
#3	Maximum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for 5-year storm, with a wet well level of 66m	644	1,233	47.8%	to MH HR06A008, near downstream end of ESI, approx. 860 m u/s of WWTP
#4	Minimum Peak Sanitary Flow from SCUBE East (from Table 3-2) plus 2031 sanitary flows for remaining drainage areas, for 5-year storm, with a wet well level of 66m	516	1,233	58.2%	to MH HR06A008, near downstream end of ESI, approx. 860 m u/s of WWTP
#5	Maximum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for Dec 1, 2006 storm event, using actual time series of observed wet well levels (max level = 72.56m)	615	1,233	50.1%	to MH SK03A002, approx. 1,600 m d/s of SCUBE East inflow to ESI
#6	Minimum Peak Sanitary Flow from SCUBE East (from Table 3-1) plus 2031 sanitary flows for remaining drainage areas, for Dec 1, 2006 storm event, using actual time series of observed wet well levels (max level = 72.56m)	488	1,233	60.4%	to MH SK03A002, approx. 1,600 m d/s of SCUBE East inflow to ESI

- For Flow Scenario #1 (maximum population density and DWF), the estimated peak flow into the ESI at manhole SM03A001 is 490 L/s, including the peak flow from SCUBE East, so there is over 60% of spare capacity at this point in the ESI at peak DWF.
- For Flow Scenario #2 (minimum population density and DWF), the estimated peak flow into the ESI at manhole SM03A001 is 363 L/s, including the peak flow from SCUBE East, so there is over 70% of spare capacity at this point in the ESI at peak DWF.
- For Flow Scenario #3 (maximum population density and 5-year storm), the estimated peak flow into the ESI at manhole SM03A001 is 644 L/s, including the peak flow from SCUBE East, so there is over 47% of spare capacity at this point in the ESI at peak flow for the 5-year storm.
- For Flow Scenario #4 (minimum population density and 5-year storm), the estimated peak flow into the ESI at manhole SM03A001 is 516 L/s, including the peak flow from SCUBE East, so there is over 58% of spare capacity at this point in the ESI at peak flow for the 5-year storm.
- For Flow Scenario #5 (maximum population density and December 1, 2006 storm event), the estimated peak flow into the ESI at manhole SM03A001 is 615 L/s, including the peak flow from SCUBE East, so there was over 50% of spare capacity at this point in the ESI at peak flow during the December 1, 2006 storm event.
- For Flow Scenario #6 (minimum population density and December 1, 2006 storm event), the estimated peak flow into the ESI at manhole SM03A001 is 488 L/s, including the peak flow from SCUBE East, so there is over 60% of spare capacity at this point in the ESI at peak flow during the December 1, 2006 storm event.
- Under normal operating conditions, the maximum Woodward WWTP Wet Well level of 66 m only impacts the ESI back to manhole HR06A008 near the downstream end of the ESI, approximately 1,035 m upstream of the WWTP.
- During the December 1, 2006 storm event, the observed Woodward WWTP Wet Well reached a maximum elevation of 72.56m at approximately 13:10 on December 1. As indicated by Figures 3-7 and 3-8, this wet well level would have impacted the ESI back to manhole SK03A002, which is still over 1,600 m downstream of the point of inflow from SCUBE East.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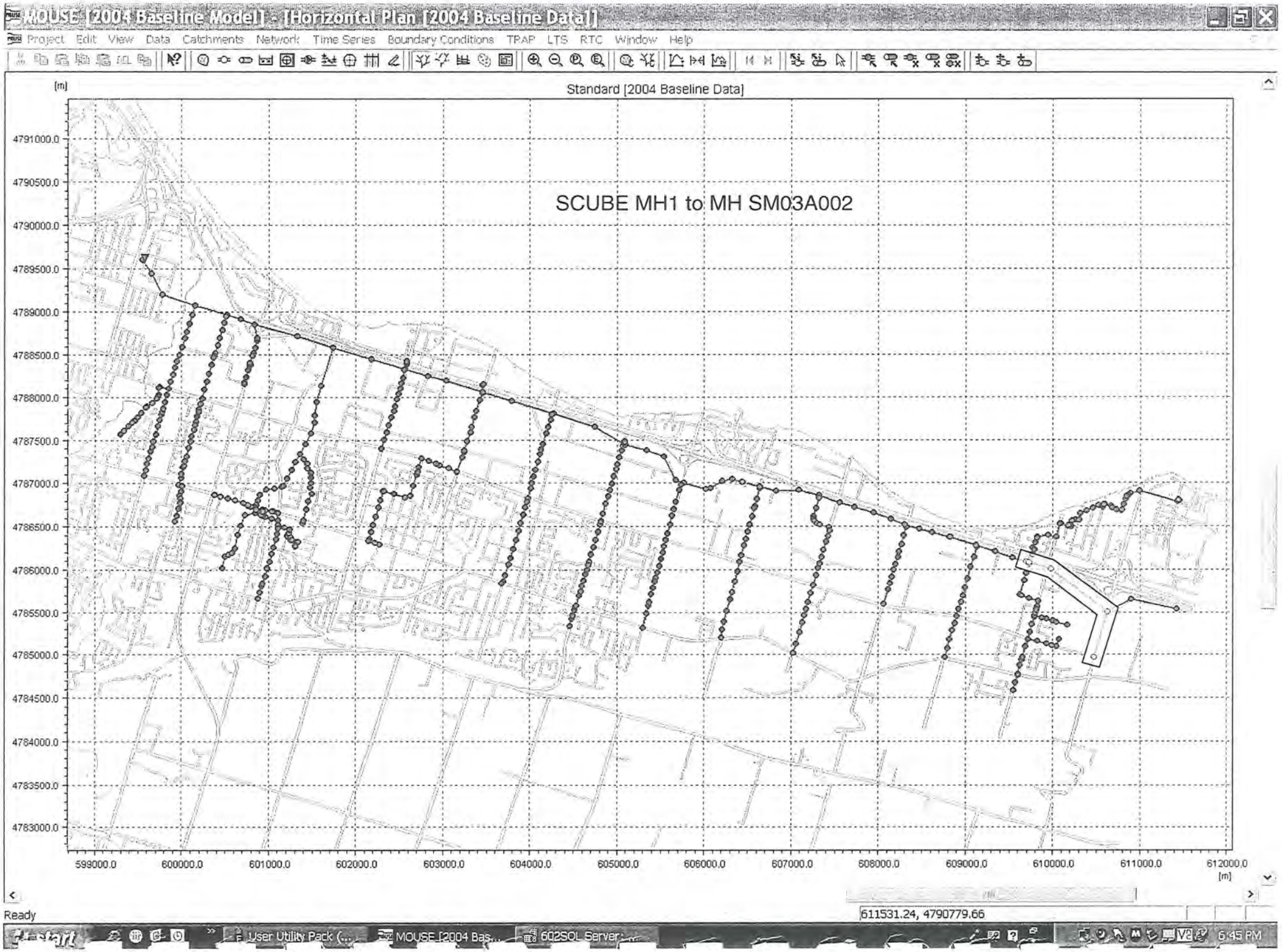
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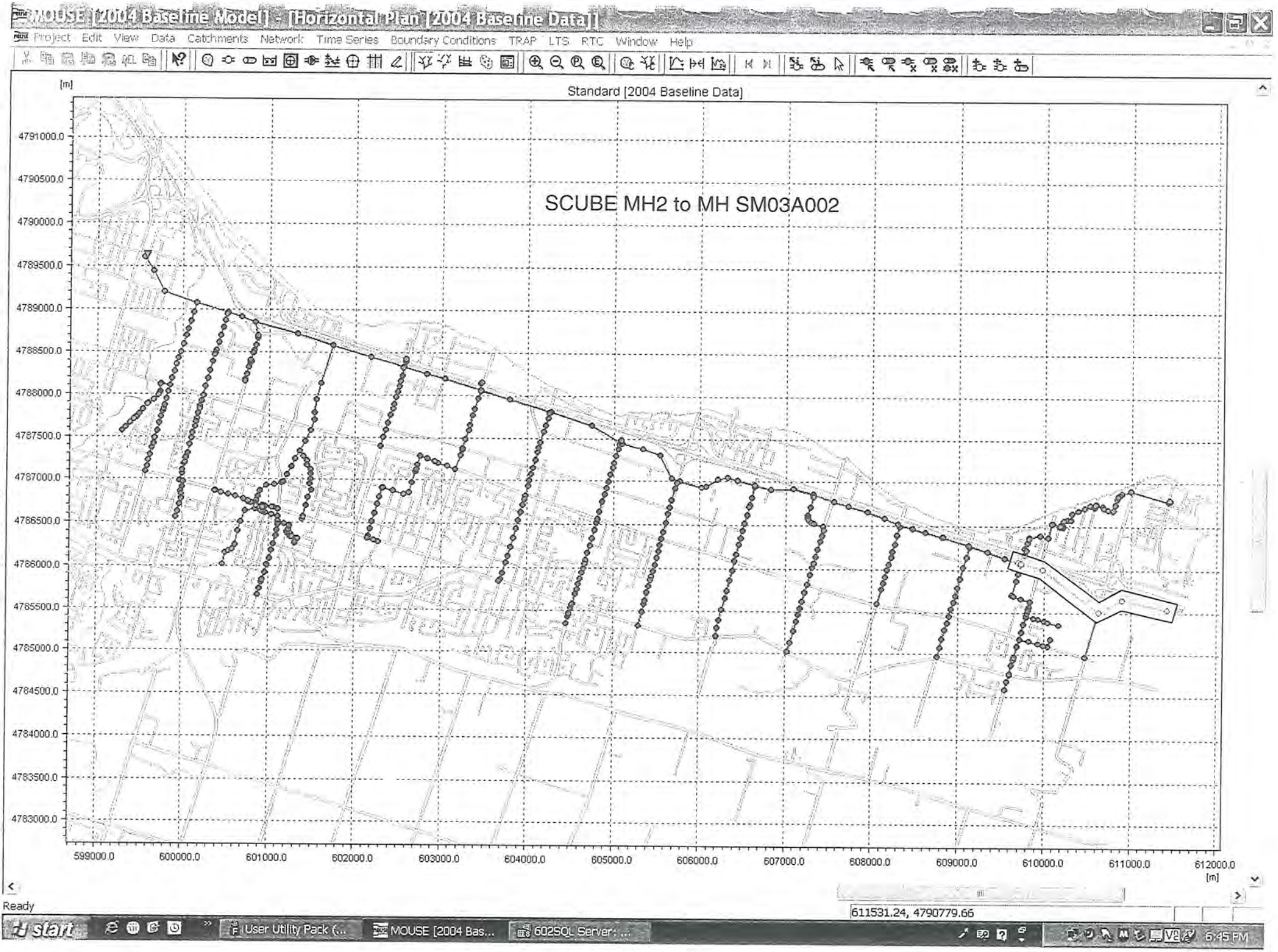
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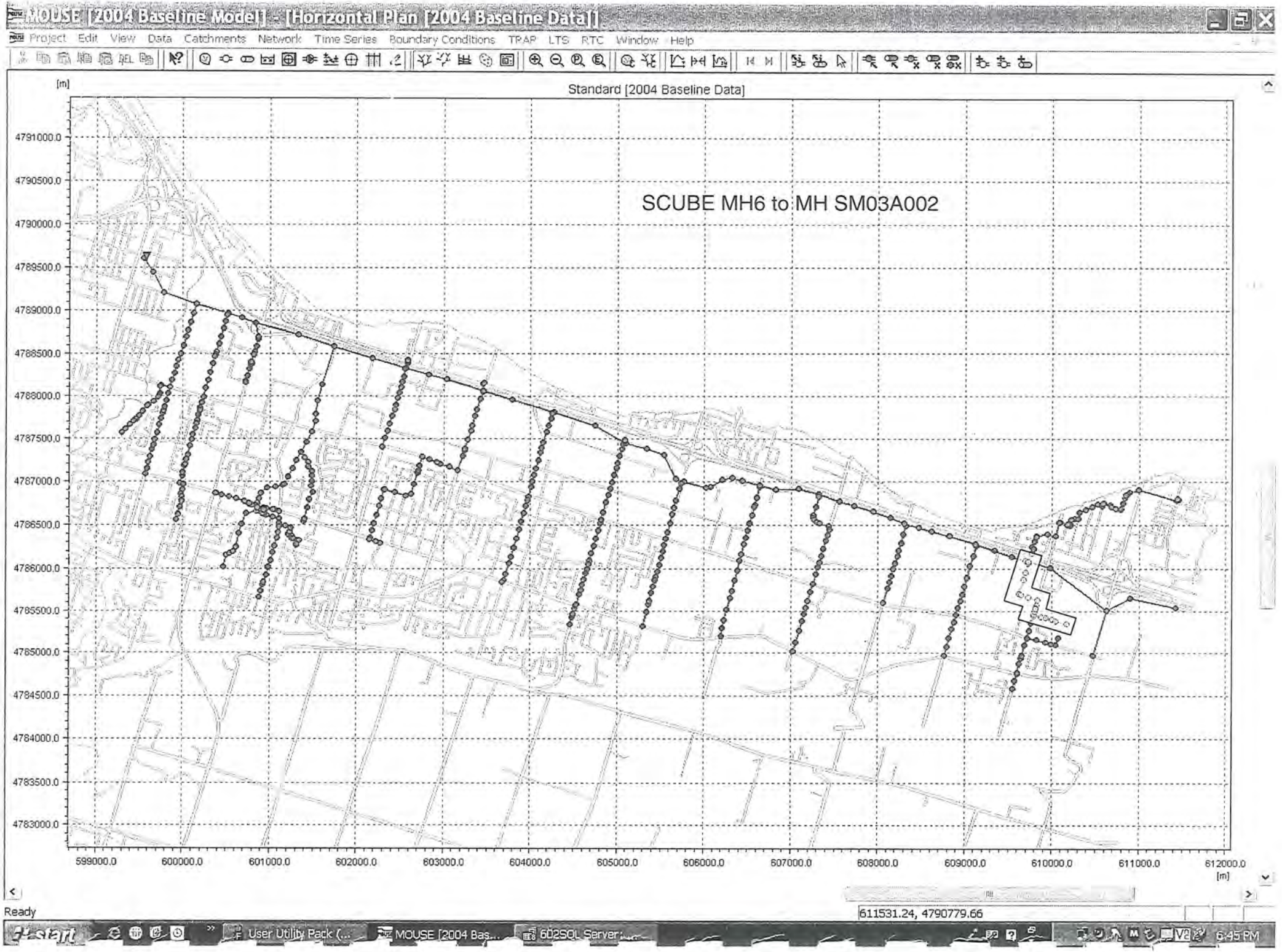
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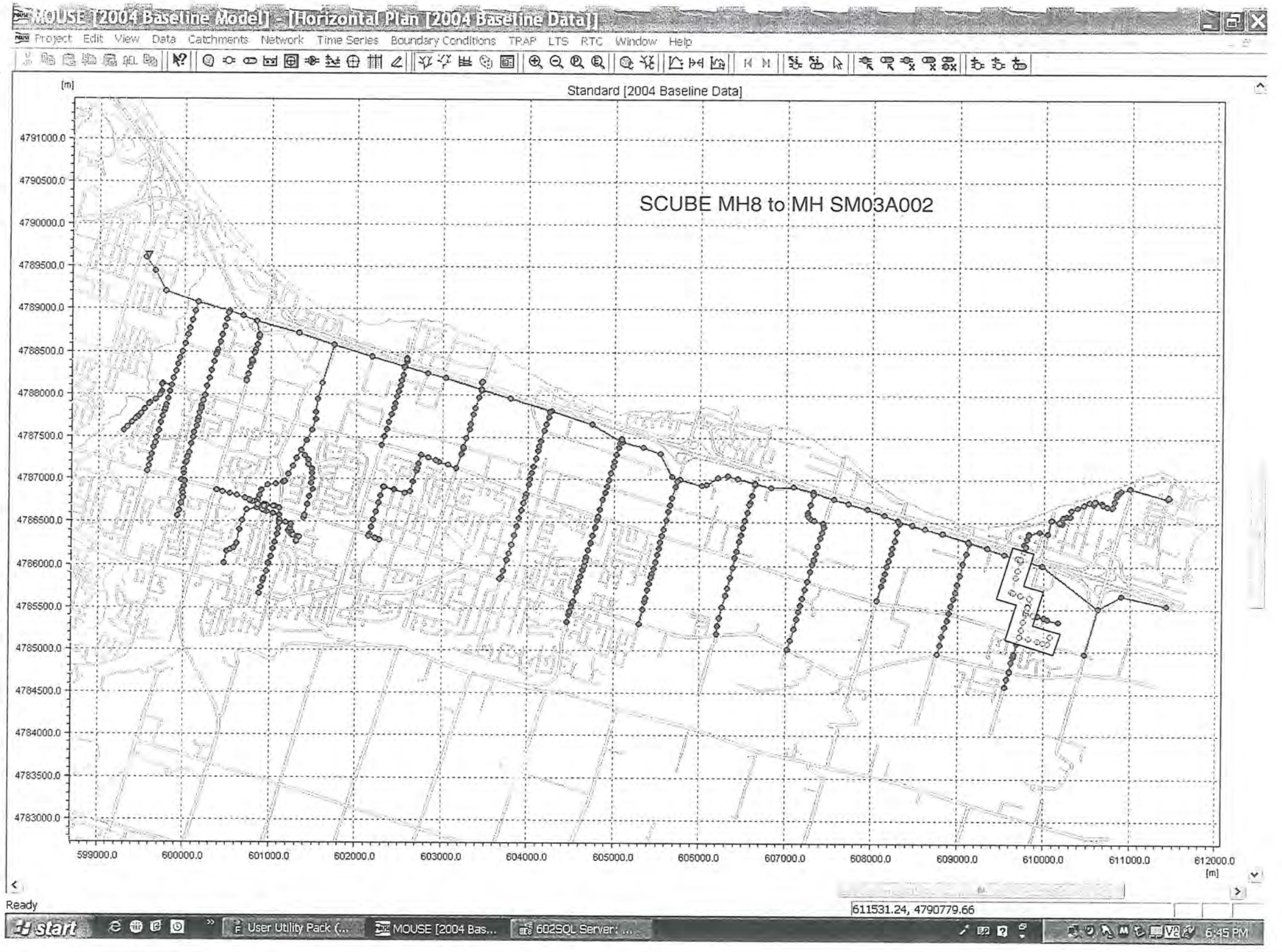
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MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF]

File View Plot Animation Tools Window Help

WATER LEVEL BRANCHES - 1-6-2004 10:15:25 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF

Discharge	0.224	0.282	0.400	0.490	m3/s

SCUBE MH1 SCUBE MH3B SCUBE MH4 SCUBE MH5 SM03A001 SM03A002

[m]

SCUBE MH1 to MH SM03A002

91.5 91.0 90.5 90.0 89.5 89.0 88.5 88.0 87.5 87.0 86.5 86.0 85.5 85.0 84.5 84.0 83.5 83.0 82.5 82.0 81.5 81.0 80.5 80.0 79.5 79.0 78.5 78.0 77.5 77.0 76.5 76.0 75.5

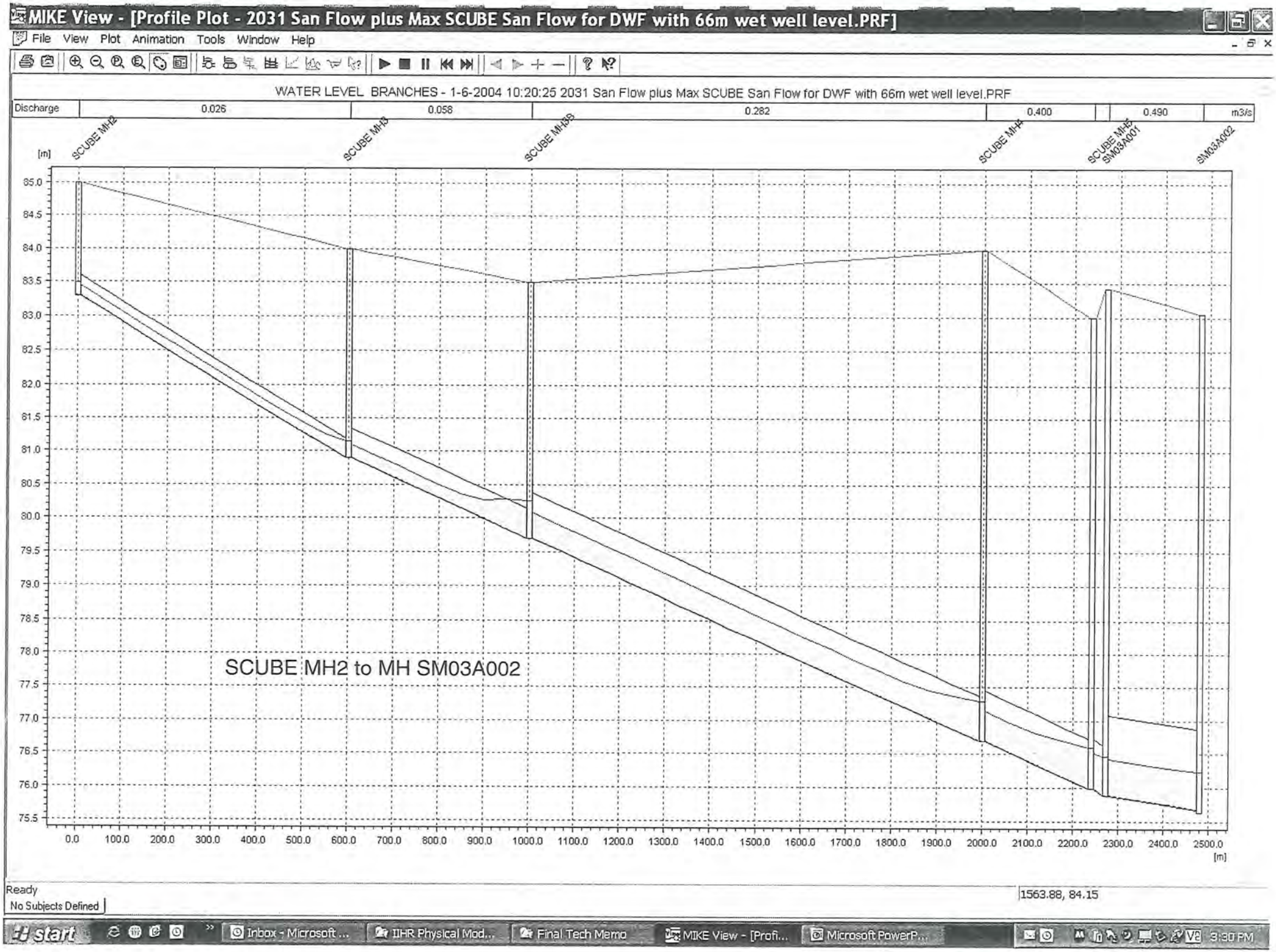
0.0 100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0 1800.0 1900.0 2000.0 [m]

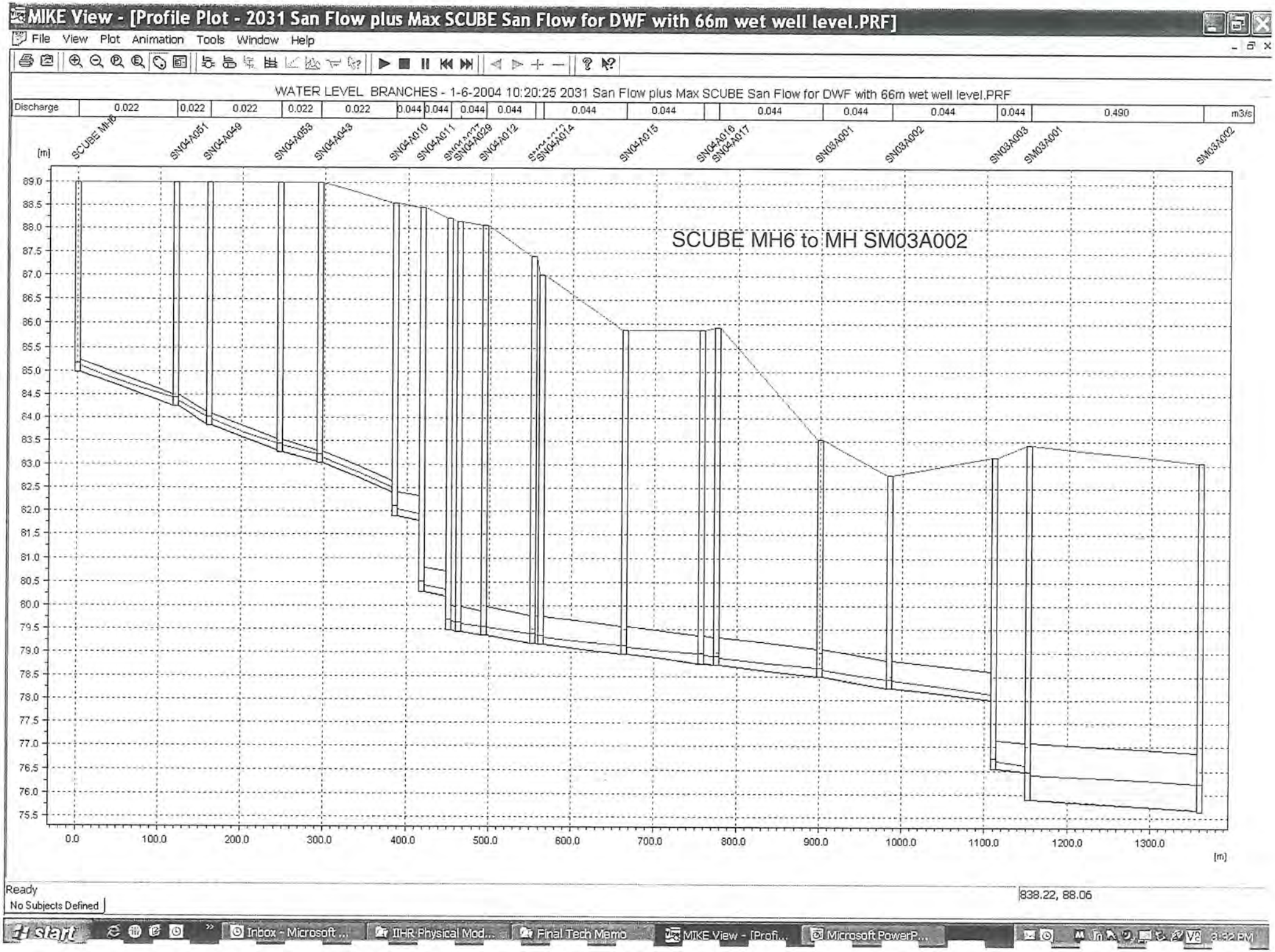
Ready

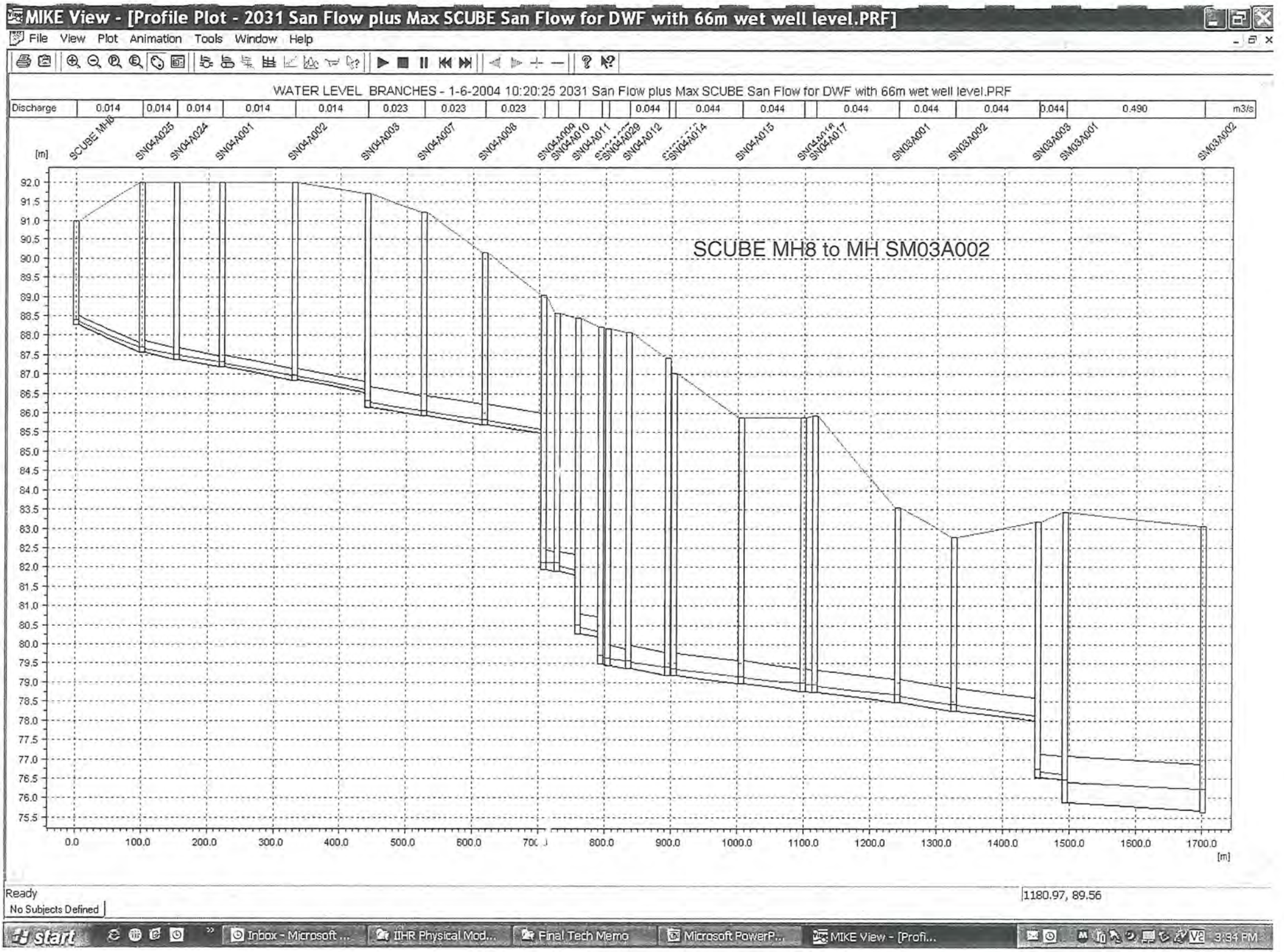
No Subjects Defined

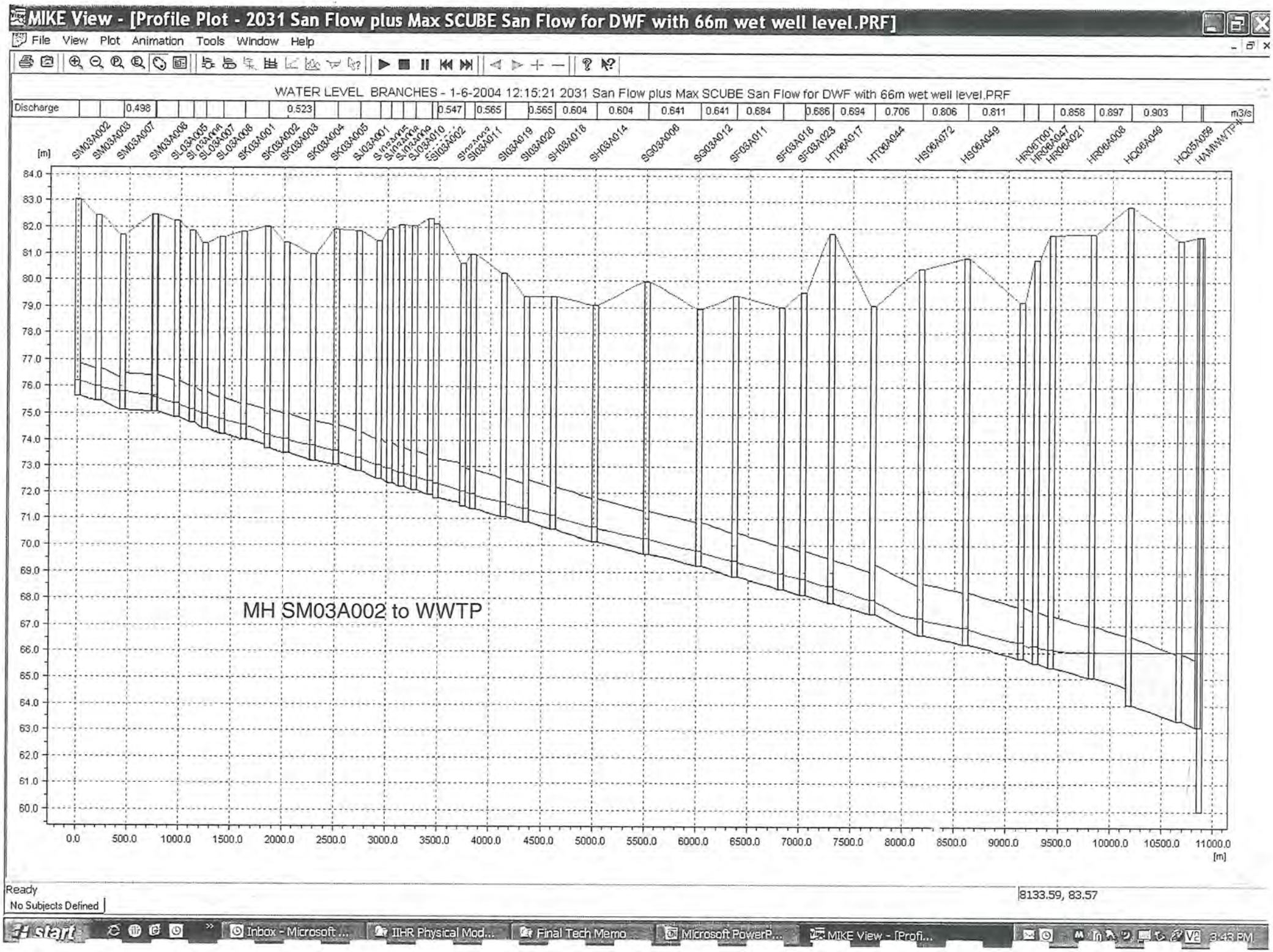
1677.55, 88.41

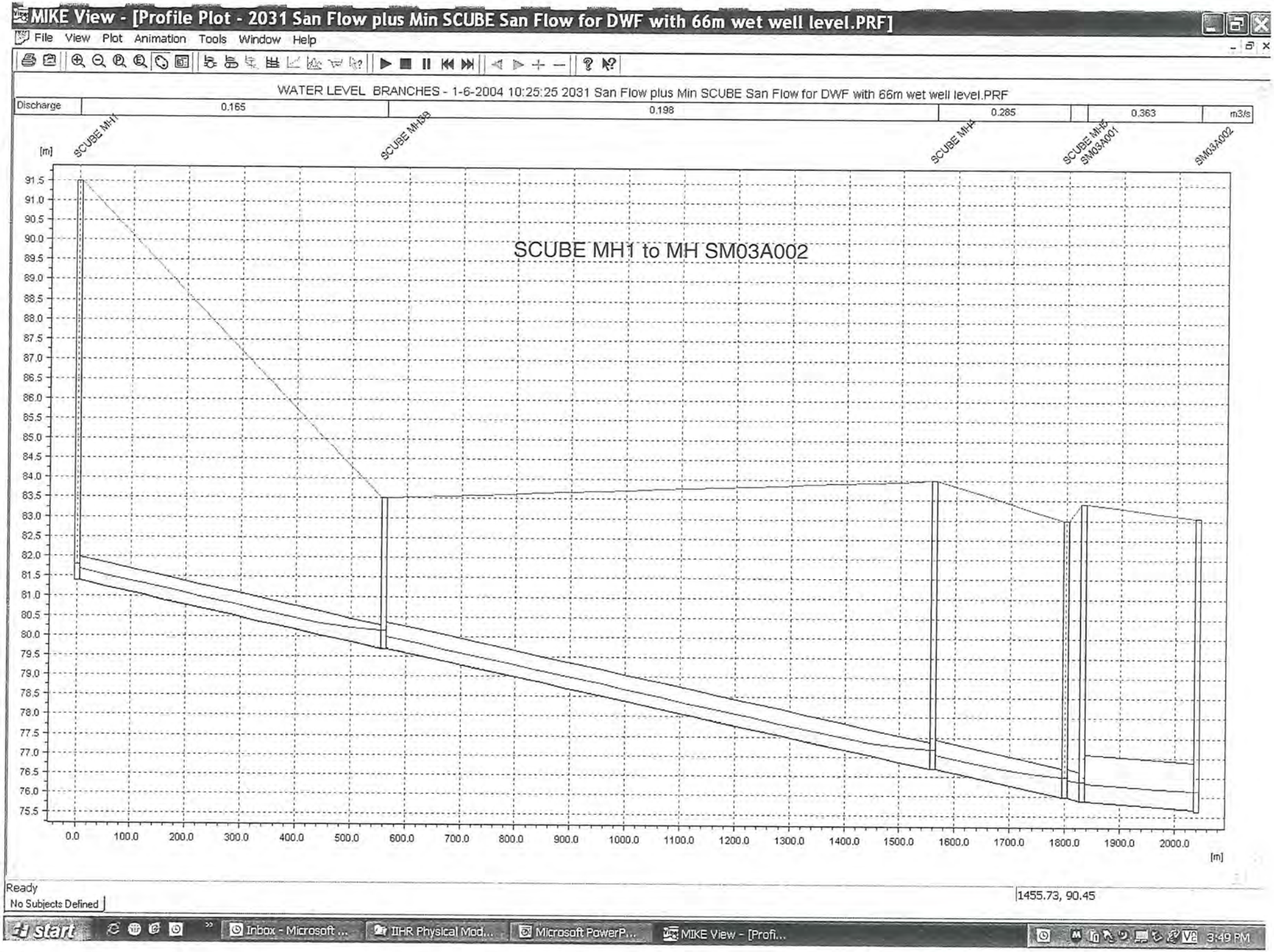
Start Inbox - Microsoft ... IHR Physical Mod... My Computer MIKE View - [Profi... 3:27 PM

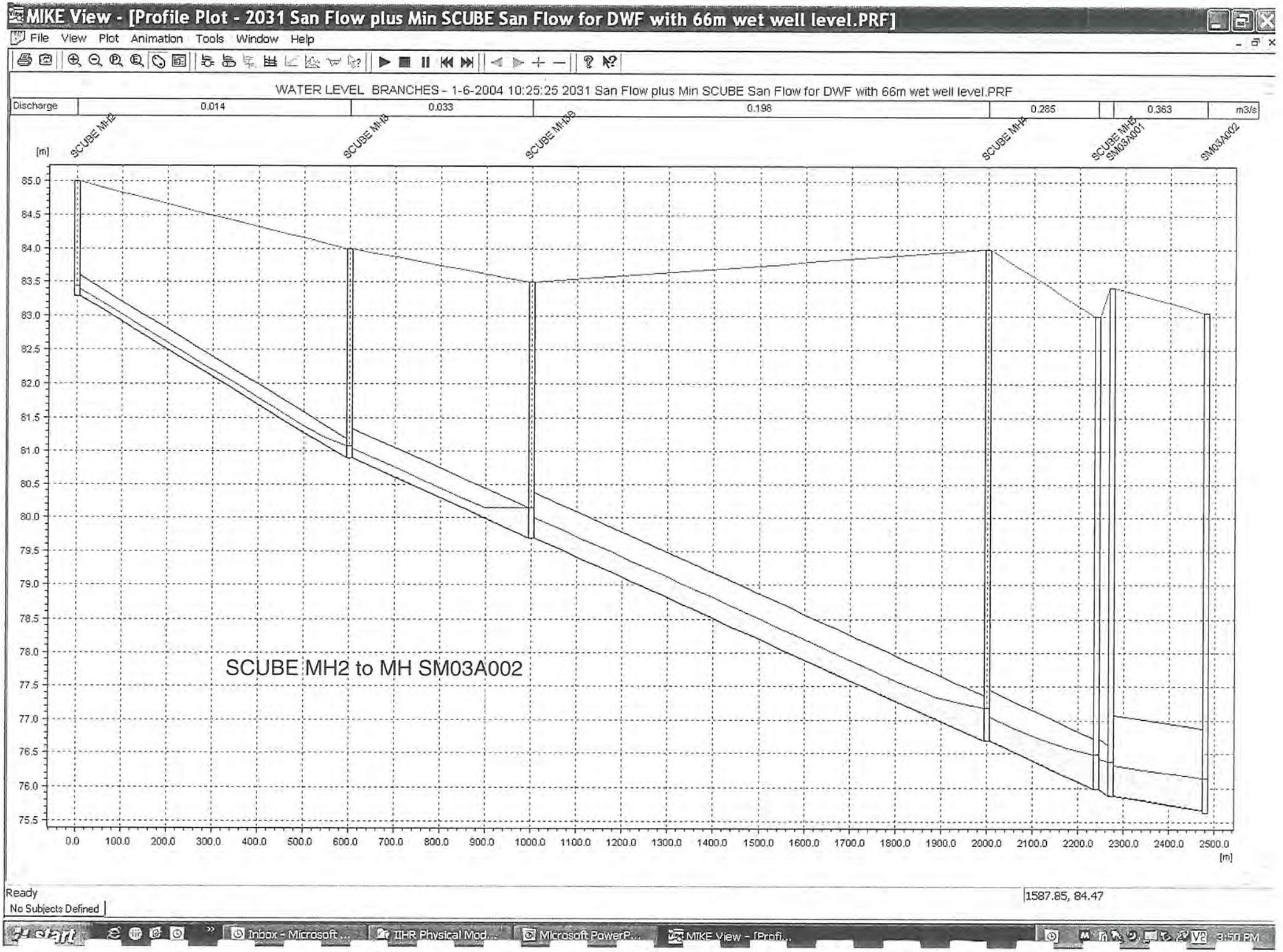

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 10:20:25 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.026
0.058
0.282
0.400
0.490
m3/s
SCUBE MH2
SCUBE MH3
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
2100.0
2200.0
2300.0
2400.0
2500.0
[m]
SCUBE MH2 to MH SM03A002
Ready
No Subjects Defined
1563.88, 84.15
start
Inbox - Microsoft ...
IIHR Physical Mod...
Final Tech Memo
MIKE View - [Profi...
Microsoft PowerP...
3:30 PM

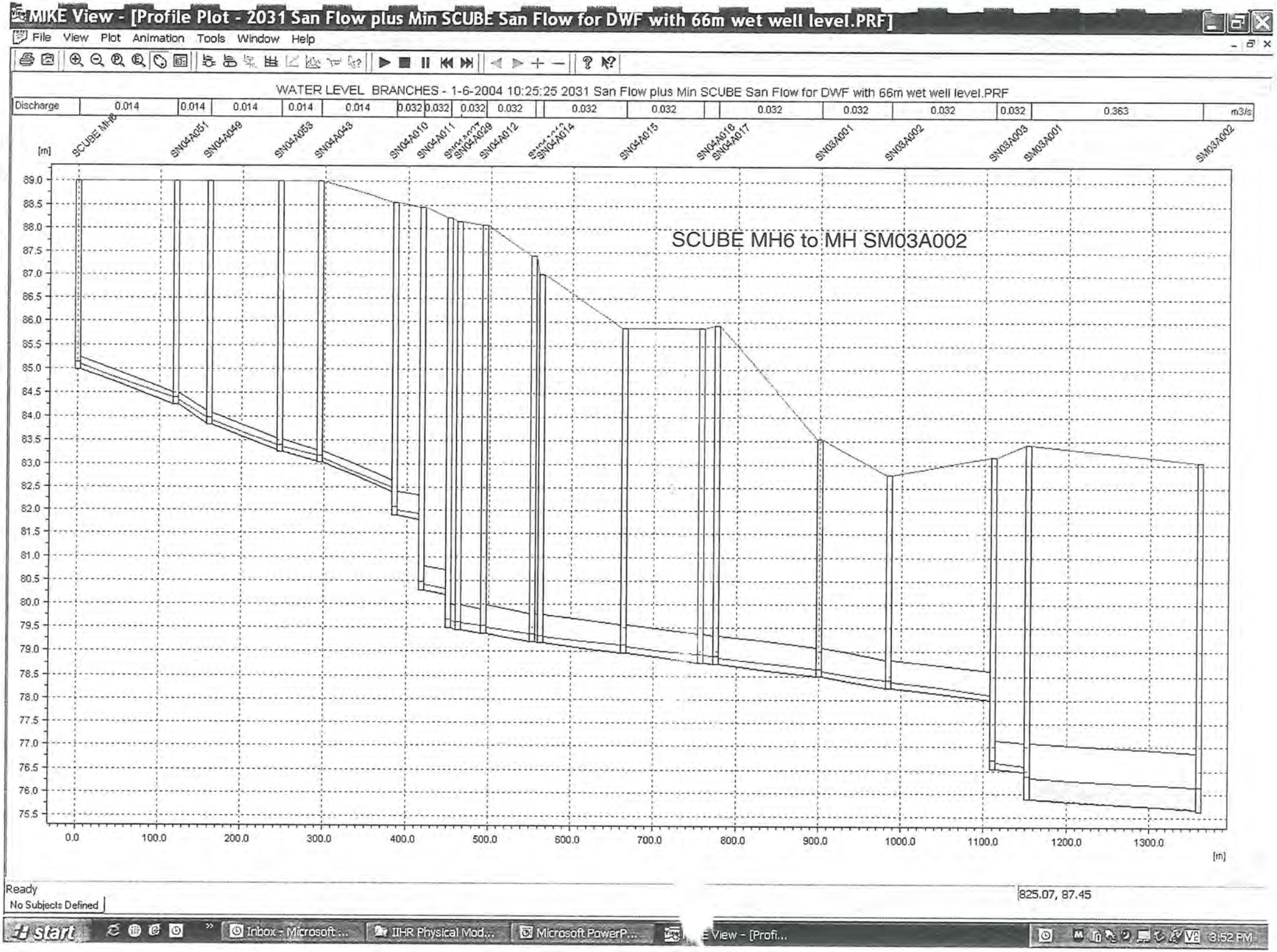

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 10:20:25 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.022
0.044
0.490
m3/s
[m]
SCUBE MH6
SN04A051
SN04A049
SN04A053
SN04A043
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
SCUBE MH6 to MH SM03A002
89.0
88.5
88.0
87.5
87.0
86.5
86.0
85.5
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
[m]
Ready
No Subjects Defined
838.22, 88.06
start
Inbox - Microsoft ...
IIHR Physical Mod...
Final Tech Memo
MIKE View - [Profi...
Microsoft PowerP...
3:32 PM

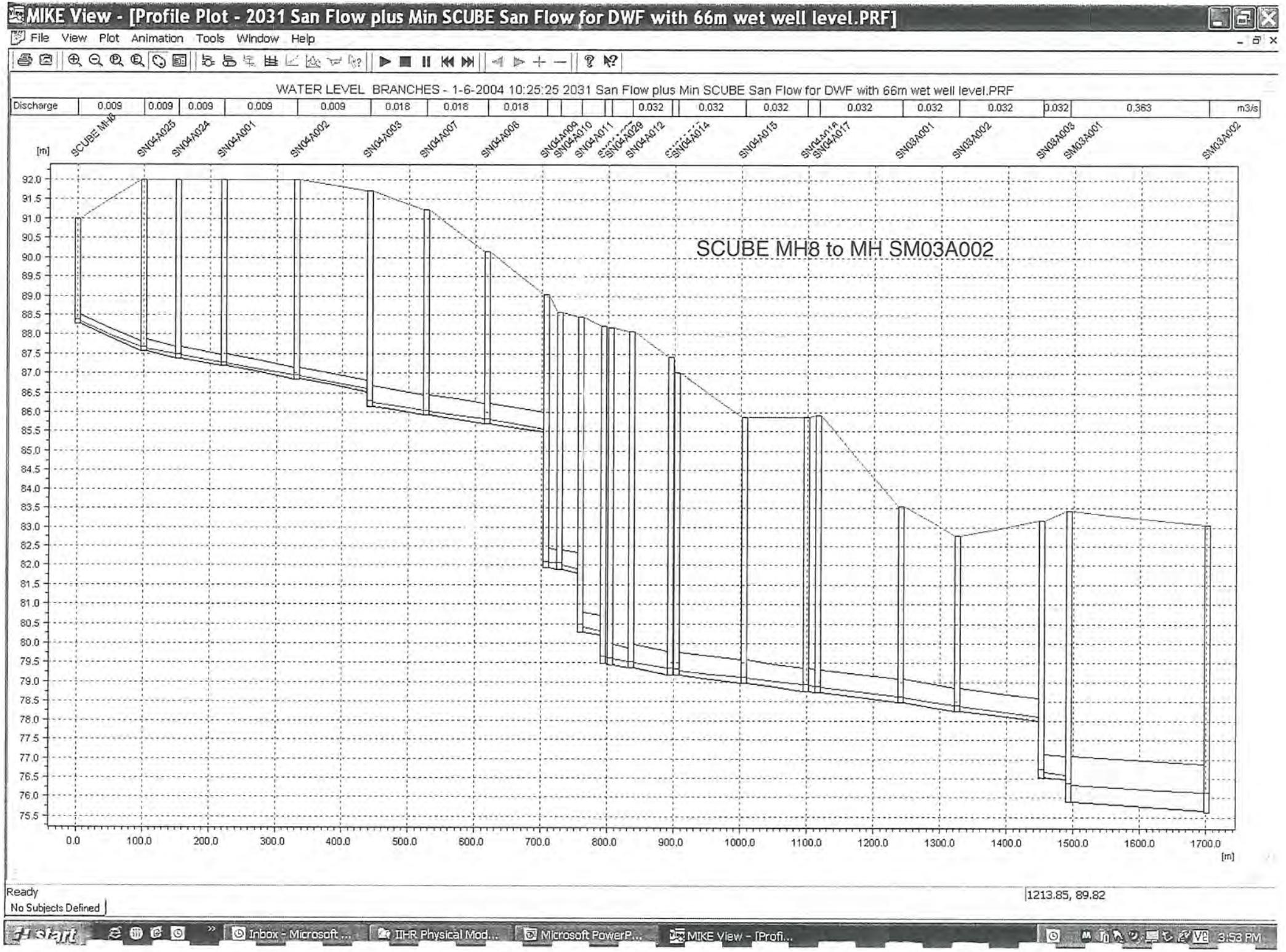

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 10:20:25 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.014
0.014
0.014
0.014
0.014
0.023
0.023
0.023
0.044
0.044
0.044
0.044
0.044
0.044
0.044
0.490
m3/s
SCUBE MH8
SN04A025
SN04A024
SN04A001
SN04A002
SN04A003
SN04A007
SN04A008
SN04A009
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
[m]
SCUBE MH8 to MH SM03A002
92.0
91.5
91.0
90.5
90.0
89.5
89.0
88.5
88.0
87.5
87.0
86.5
86.0
85.5
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
1400.0
1500.0
1600.0
1700.0
[m]
Ready
No Subjects Defined
1180.97, 89.56
start
Inbox - Microsoft ...
IIHR Physical Mod...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
3:34 PM

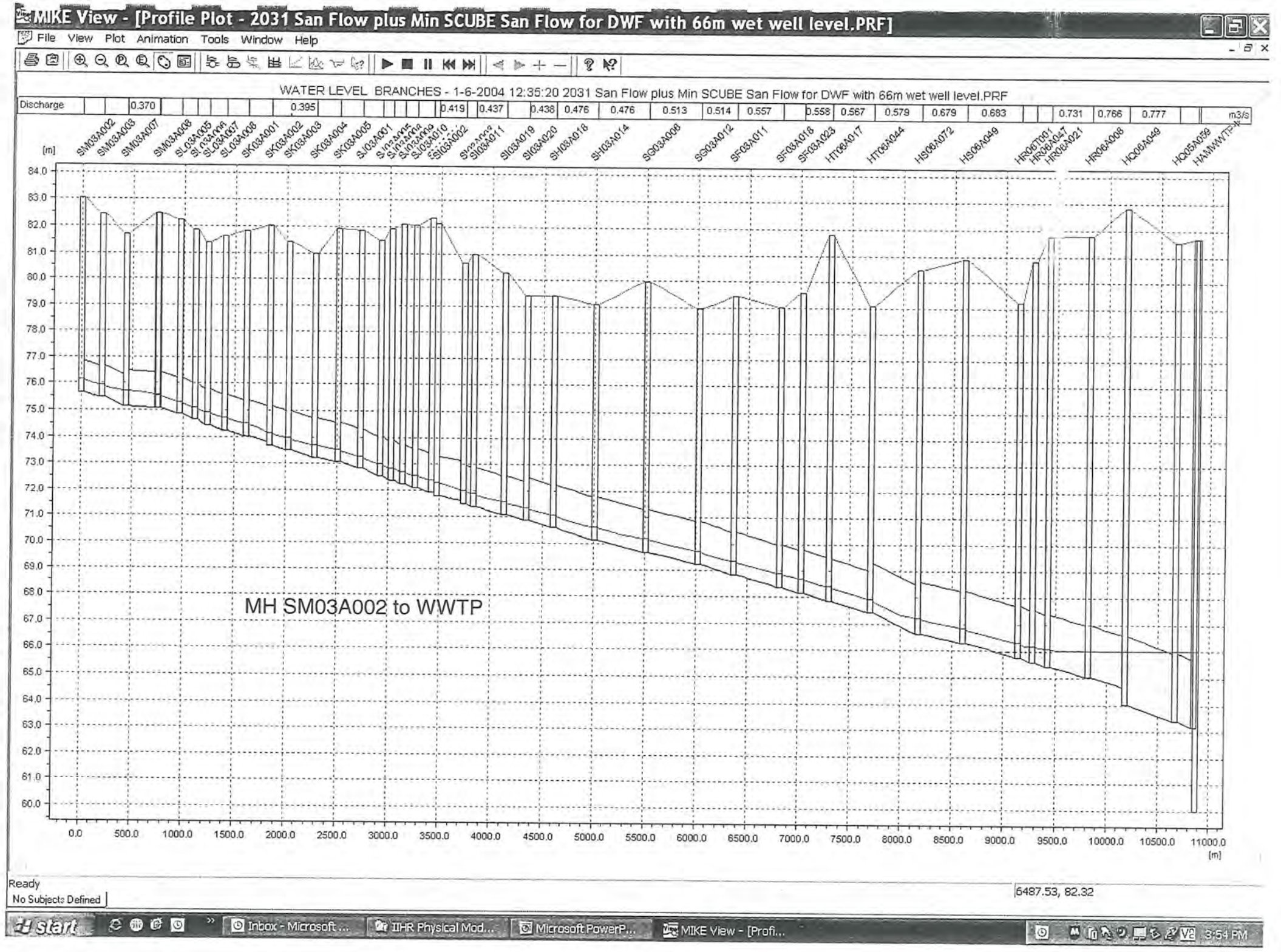

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:15:21 2031 San Flow plus Max SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.498
0.523
0.547
0.565
0.565
0.604
0.604
0.641
0.641
0.684
0.686
0.694
0.706
0.806
0.811
0.858
0.897
0.903
m3/s
[m]
SM03A002
SM03A003
SM03A007
SM03A008
SL03A005
SL03A007
SL03A008
SK03A001
SK03A002
SK03A003
SK03A004
SK03A005
SJ03A001
SI03A011
SI03A019
SI03A020
SH03A016
SH03A014
SG03A006
SG03A012
SF03A011
SF03A018
SF03A023
HT06A017
HT06A044
HS06A072
HS06A049
HR06T001
HR06A047
HR06A021
HR06A008
HQ06A049
HQ05A059
MH SM03A002 to WWTP
84.0
83.0
82.0
81.0
80.0
79.0
78.0
77.0
76.0
75.0
74.0
73.0
72.0
71.0
70.0
69.0
68.0
67.0
66.0
65.0
64.0
63.0
62.0
61.0
60.0
0.0
500.0
1000.0
1500.0
2000.0
2500.0
3000.0
3500.0
4000.0
4500.0
5000.0
5500.0
6000.0
6500.0
7000.0
7500.0
8000.0
8500.0
9000.0
9500.0
10000.0
10500.0
11000.0
[m]
Ready
No Subjects Defined
8133.59, 83.57
start
Inbox - Microsoft ...
IIHR Physical Mod...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
3:43 PM

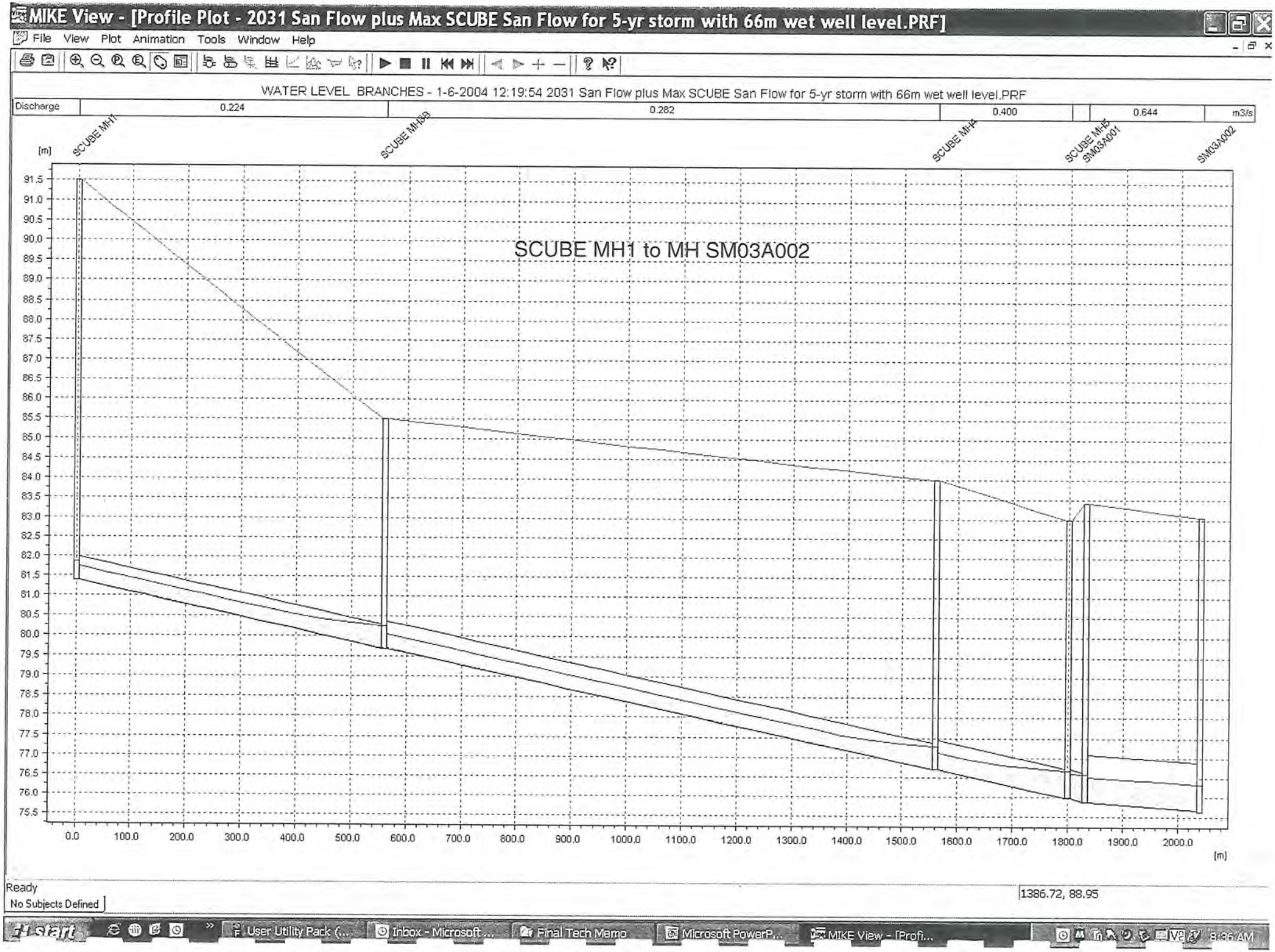

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 10:25:25 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.165
0.198
0.285
0.363
m3/s
SCUBE MH1
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH1 to MH SM03A002
[m]
Ready
No Subjects Defined
1455.73, 90.45
start
Inbox - Microsoft ...
IHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
3:49 PM

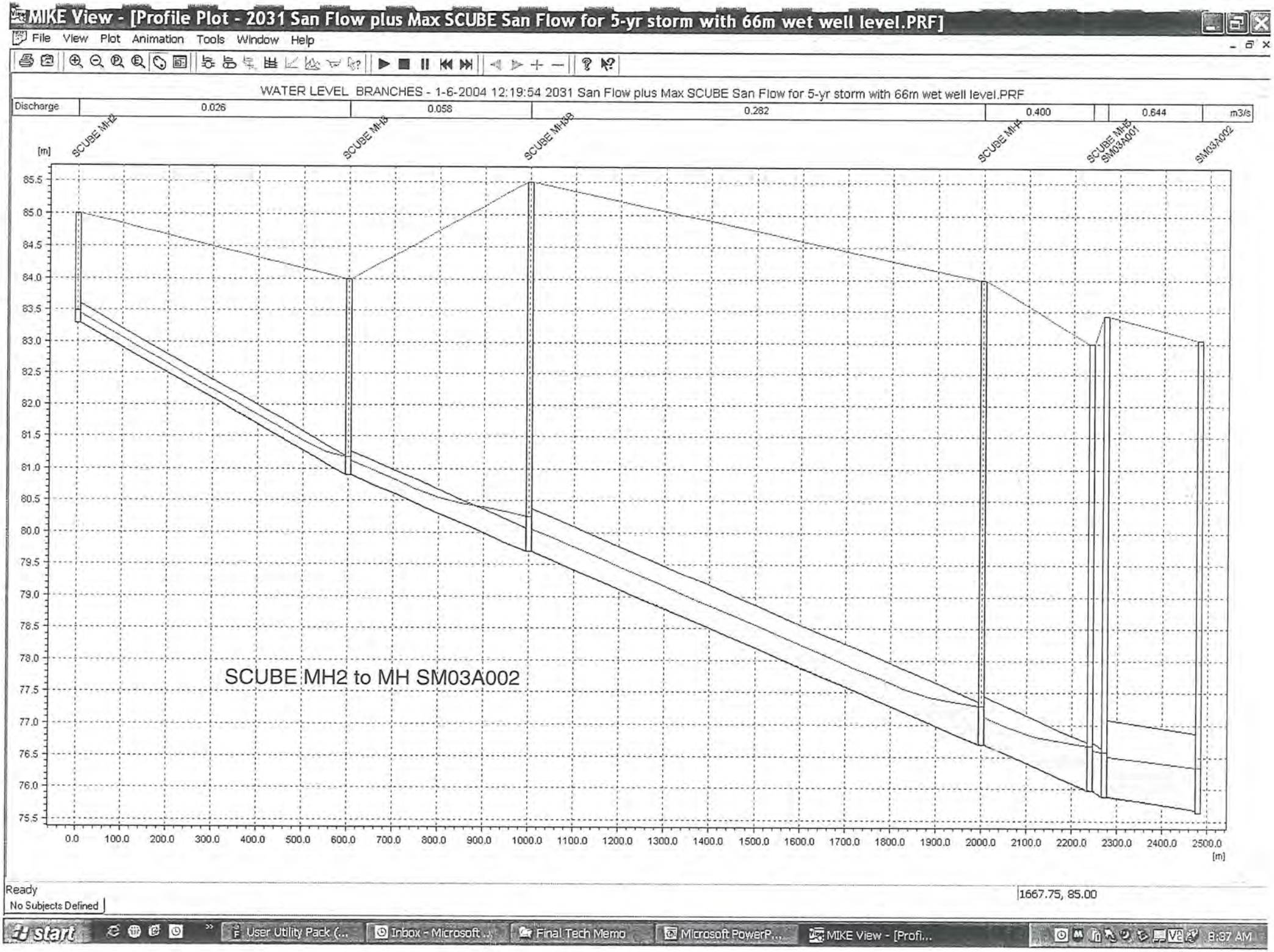

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 10:25:25 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.014
0.033
0.198
0.285
0.363
m3/s
SCUBE MH2
SCUBE MH3
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
2100.0
2200.0
2300.0
2400.0
2500.0
[m]
SCUBE MH2 to MH SM03A002
Ready
No Subjects Defined
1587.85, 84.47
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
3:50 PM

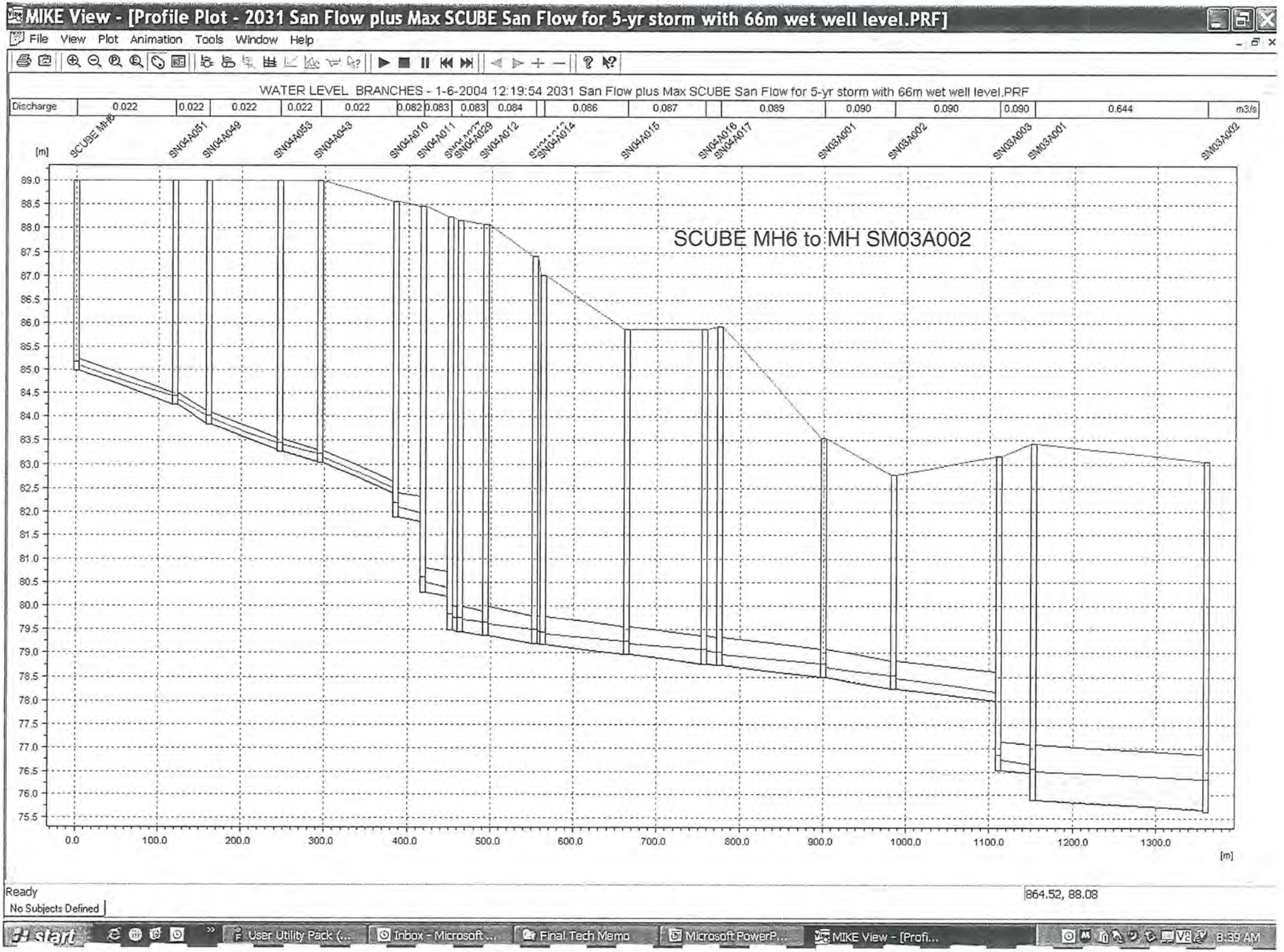

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 10:25:25 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.014
0.014
0.014
0.014
0.014
0.032
0.032
0.032
0.032
0.032
0.032
0.032
0.032
0.032
0.363
m3/s
[m]
SCUBE MH6
SN04A051
SN04A049
SN04A053
SN04A043
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A018
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
SCUBE MH6 to MH SM03A002
89.0
88.5
88.0
87.5
87.0
86.5
86.0
85.5
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
[m]
Ready
No Subjects Defined
825.07, 87.45
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
View - [Profi...
3:52 PM

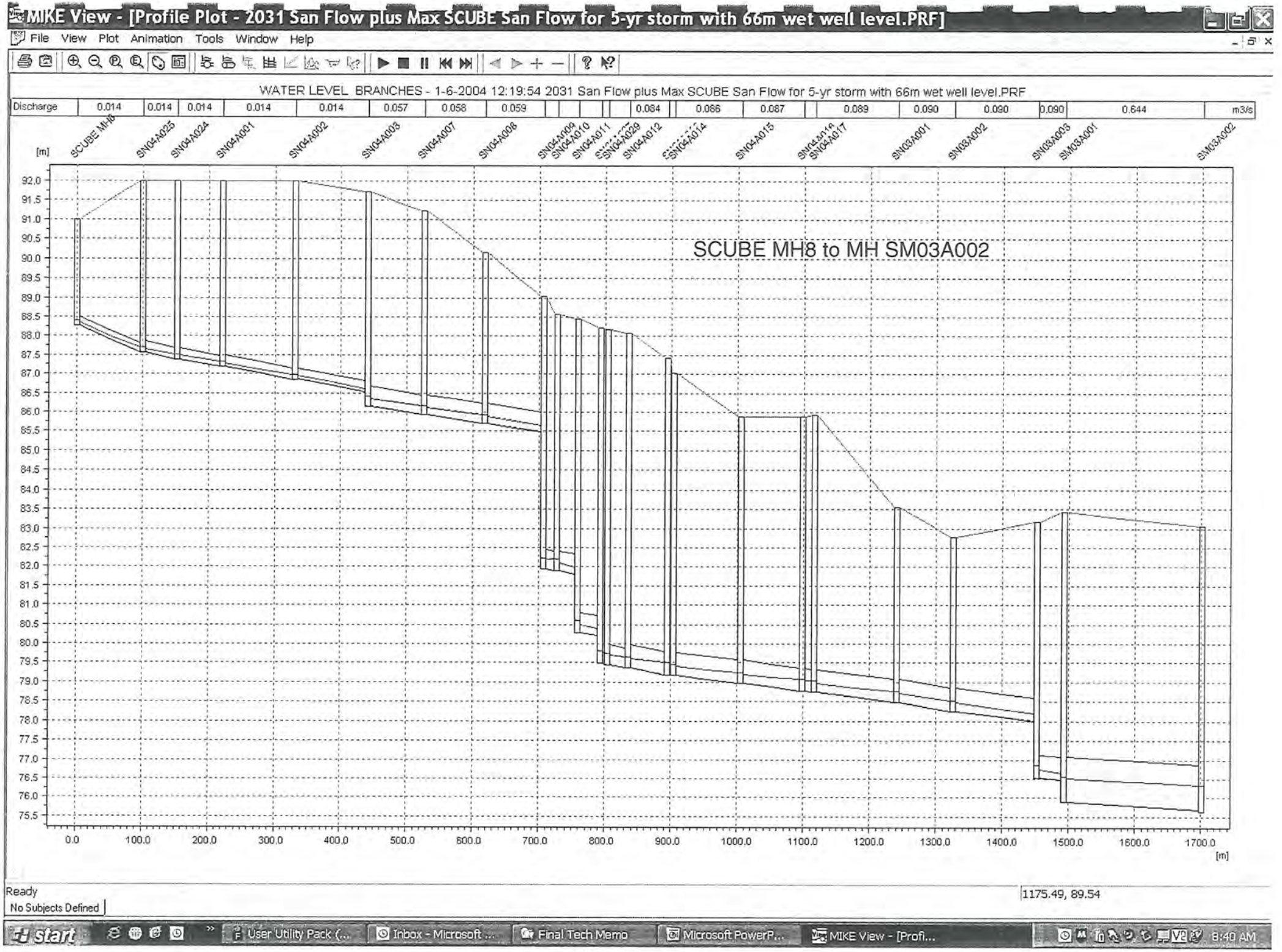

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 10:25:25 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.009 0.009 0.009 0.009 0.009 0.018 0.018 0.018 0.032 0.032 0.032 0.032 0.032 0.032 0.032 0.363 m3/s
[m]
SCUBE MH8
SN04A025
SN04A024
SN04A001
SN04A002
SN04A003
SN04A007
SN04A008
SN04A009
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
SCUBE MH8 to MH SM03A002
92.0 91.5 91.0 90.5 90.0 89.5 89.0 88.5 88.0 87.5 87.0 86.5 86.0 85.5 85.0 84.5 84.0 83.5 83.0 82.5 82.0 81.5 81.0 80.5 80.0 79.5 79.0 78.5 78.0 77.5 77.0 76.5 76.0 75.5
0.0 100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0
[m]
Ready
No Subjects Defined
1213.85, 89.82
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
3:53 PM

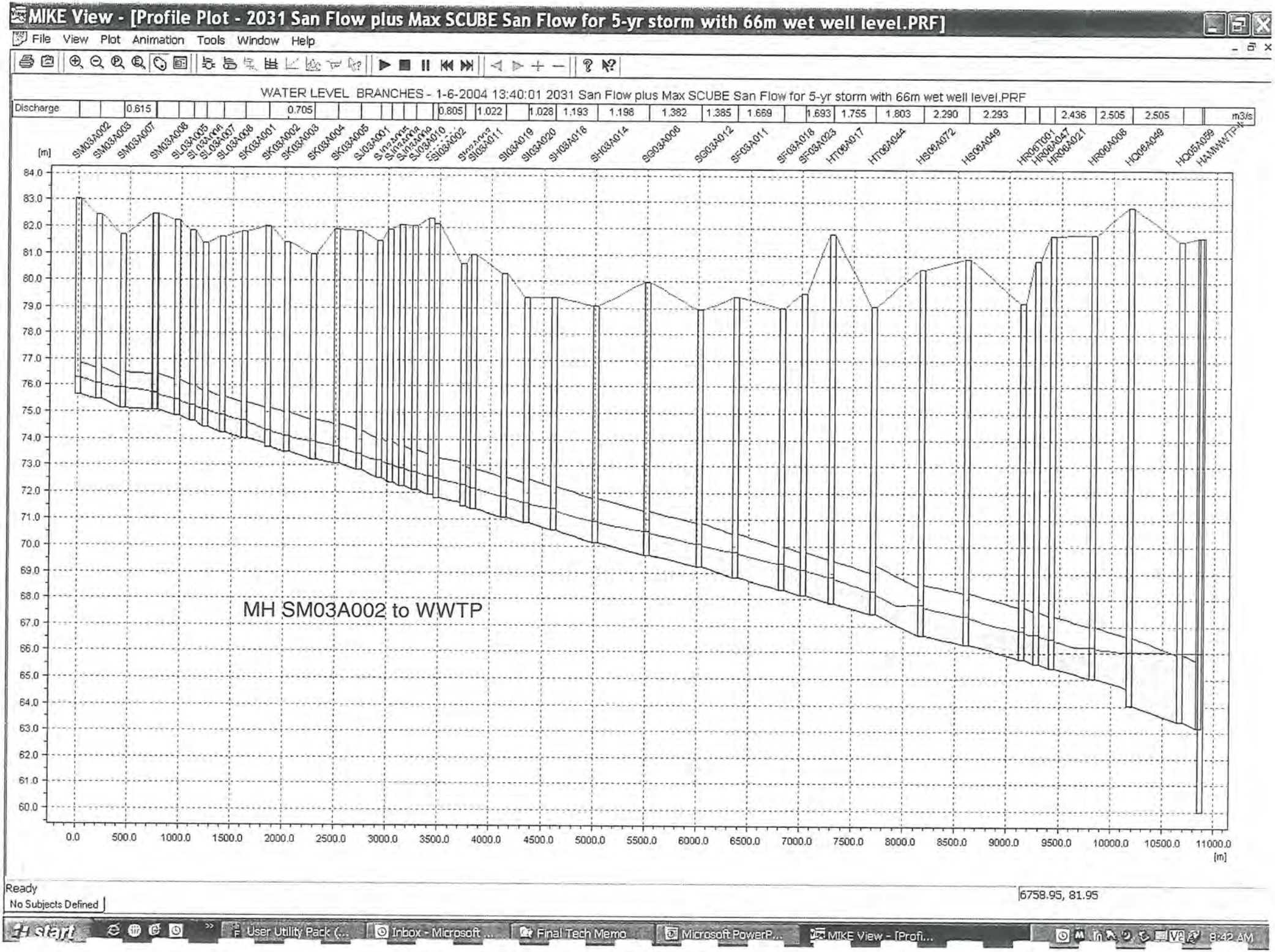

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:35:20 2031 San Flow plus Min SCUBE San Flow for DWF with 66m wet well level.PRF
Discharge
0.370
0.395
0.419
0.437
0.438
0.476
0.476
0.513
0.514
0.557
0.558
0.567
0.579
0.679
0.683
0.731
0.766
0.777
m3/s
[m]
SM03A002
SM03A003
SM03A007
SM03A008
SL03A005
SL03A006
SL03A007
SL03A008
SK03A001
SK03A002
SK03A003
SK03A004
SK03A005
SJ03A001
SJ03A010
SI03A002
SI03A011
SI03A019
SI03A020
SH03A016
SH03A014
SG03A008
SG03A012
SF03A011
SF03A018
SF03A023
HT06A017
HT06A044
HS06A072
HS06A049
HR06T001
HR06A047
HR06A021
HR06A008
HQ06A049
HQ05A059
HAMMWTP
84.0
83.0
82.0
81.0
80.0
79.0
78.0
77.0
76.0
75.0
74.0
73.0
72.0
71.0
70.0
69.0
68.0
67.0
66.0
65.0
64.0
63.0
62.0
61.0
60.0
MH SM03A002 to WWTP
0.0
500.0
1000.0
1500.0
2000.0
2500.0
3000.0
3500.0
4000.0
4500.0
5000.0
5500.0
6000.0
6500.0
7000.0
7500.0
8000.0
8500.0
9000.0
9500.0
10000.0
10500.0
11000.0
[m]
Ready
No Subjects Defined
6487.53, 82.32
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
3:54 PM

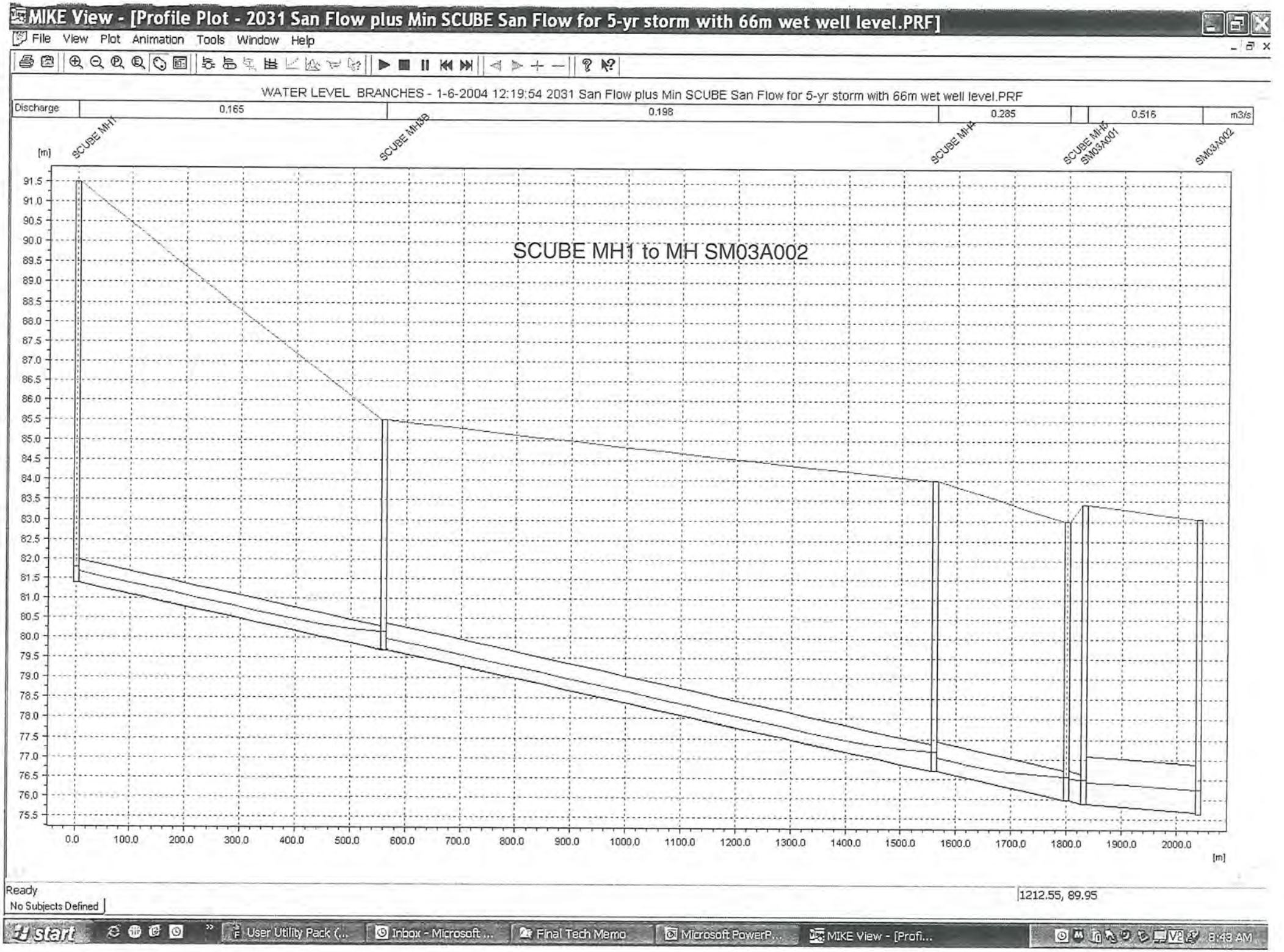

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge
0.224
0.282
0.400
0.644
m3/s
SCUBE MH1
SCUBE MH2B
SCUBE MH2A
SCUBE MH2
SM03A001
SM03A002
[m]
SCUBE MH1 to MH SM03A002
91.5
91.0
90.5
90.0
89.5
89.0
88.5
88.0
87.5
87.0
86.5
86.0
85.5
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
1400.0
1500.0
1600.0
1700.0
1800.0
1900.0
2000.0
[m]
Ready
No Subjects Defined
1386.72, 88.95
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:36 AM

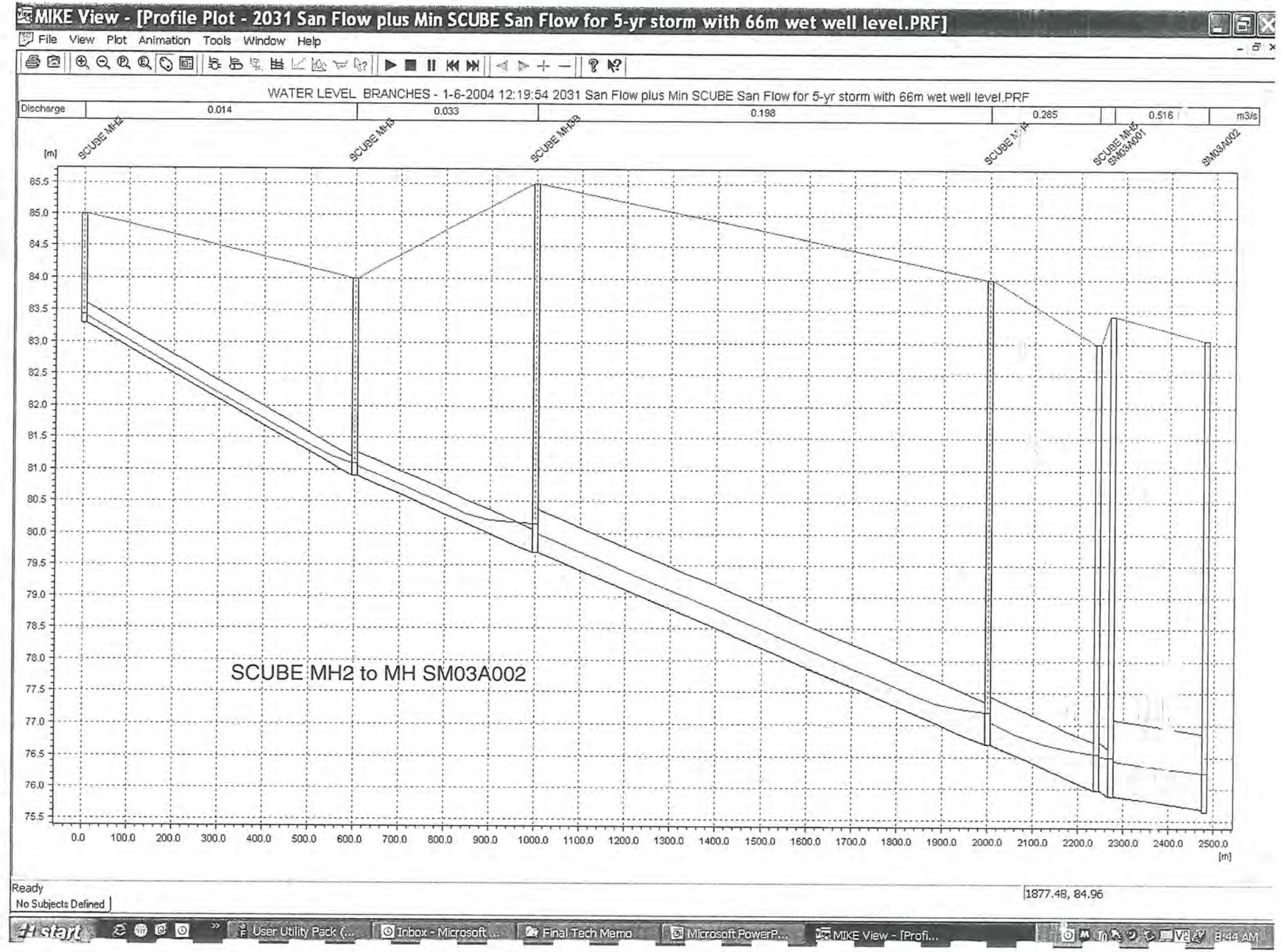

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge
0.026
0.058
0.282
0.400
0.644
m3/s
SCUBE MH2
SCUBE MH3
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH2 to MH SM03A002
[m]
Ready
No Subjects Defined
1667.75, 85.00
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:37 AM

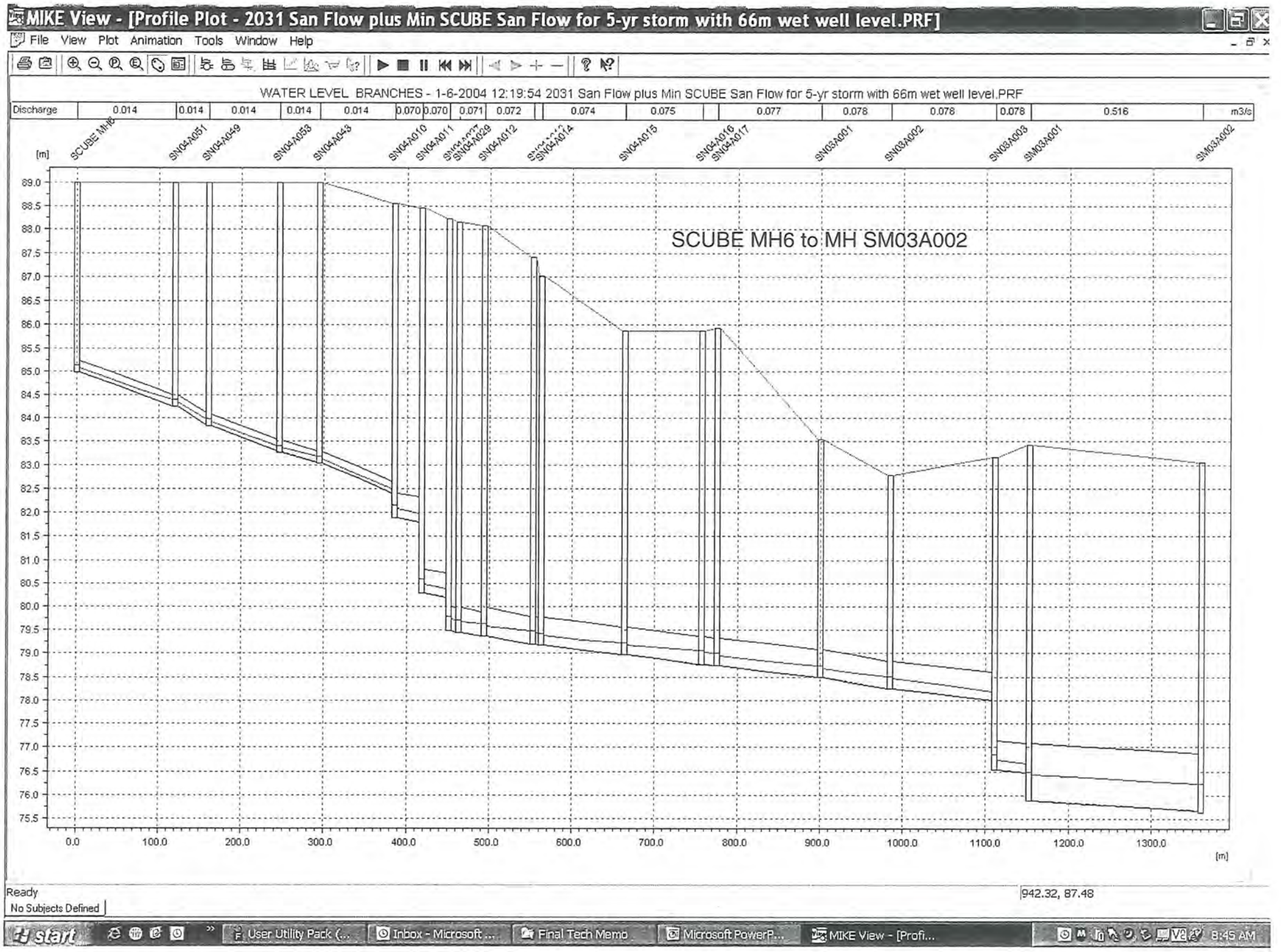

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge 0.022 0.022 0.022 0.022 0.022 0.082 0.083 0.083 0.084 0.086 0.087 0.089 0.090 0.090 0.090 0.644 m3/s
SCUBE MH6
SN04A051
SN04A049
SN04A053
SN04A043
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A018
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
[m]
89.0
88.5
88.0
87.5
87.0
86.5
86.0
85.5
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
SCUBE MH6 to MH SM03A002
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
[m]
Ready
No Subjects Defined
864.52, 88.08
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:39 AM

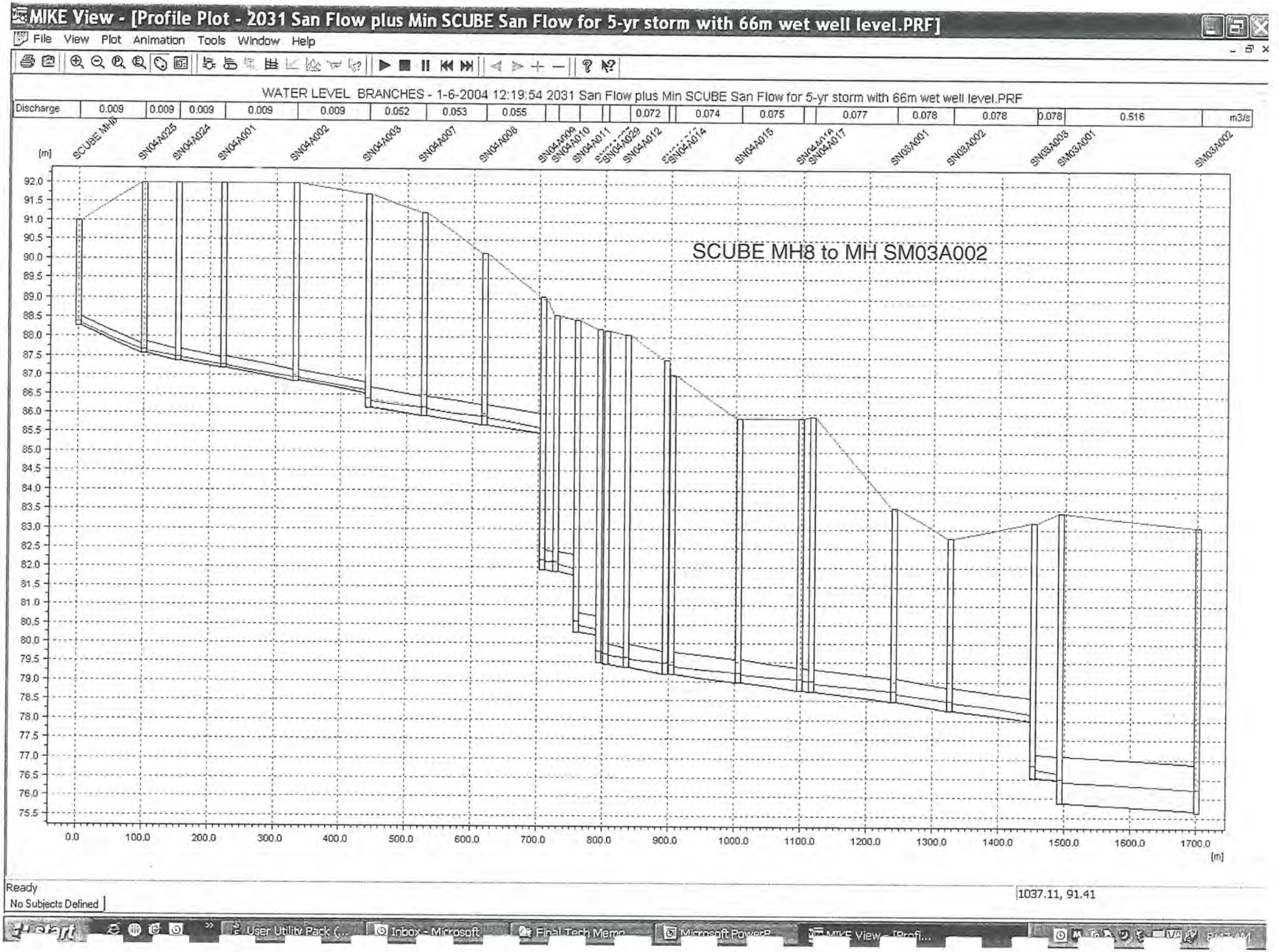

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge 0.014 0.014 0.014 0.014 0.014 0.057 0.058 0.059 0.084 0.086 0.087 0.089 0.090 0.090 0.090 0.644 m3/s
SCUBE MH8
SN04A025
SN04A024
SN04A001
SN04A002
SN04A003
SN04A007
SN04A008
SN04A009
SN04A010
SN04A011
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
[m]
SCUBE MH8 to MH SM03A002
92.0 91.5 91.0 90.5 90.0 89.5 89.0 88.5 88.0 87.5 87.0 86.5 86.0 85.5 85.0 84.5 84.0 83.5 83.0 82.5 82.0 81.5 81.0 80.5 80.0 79.5 79.0 78.5 78.0 77.5 77.0 76.5 76.0 75.5
0.0 100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0
[m]
Ready
No Subjects Defined
1175.49, 89.54
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:40 AM

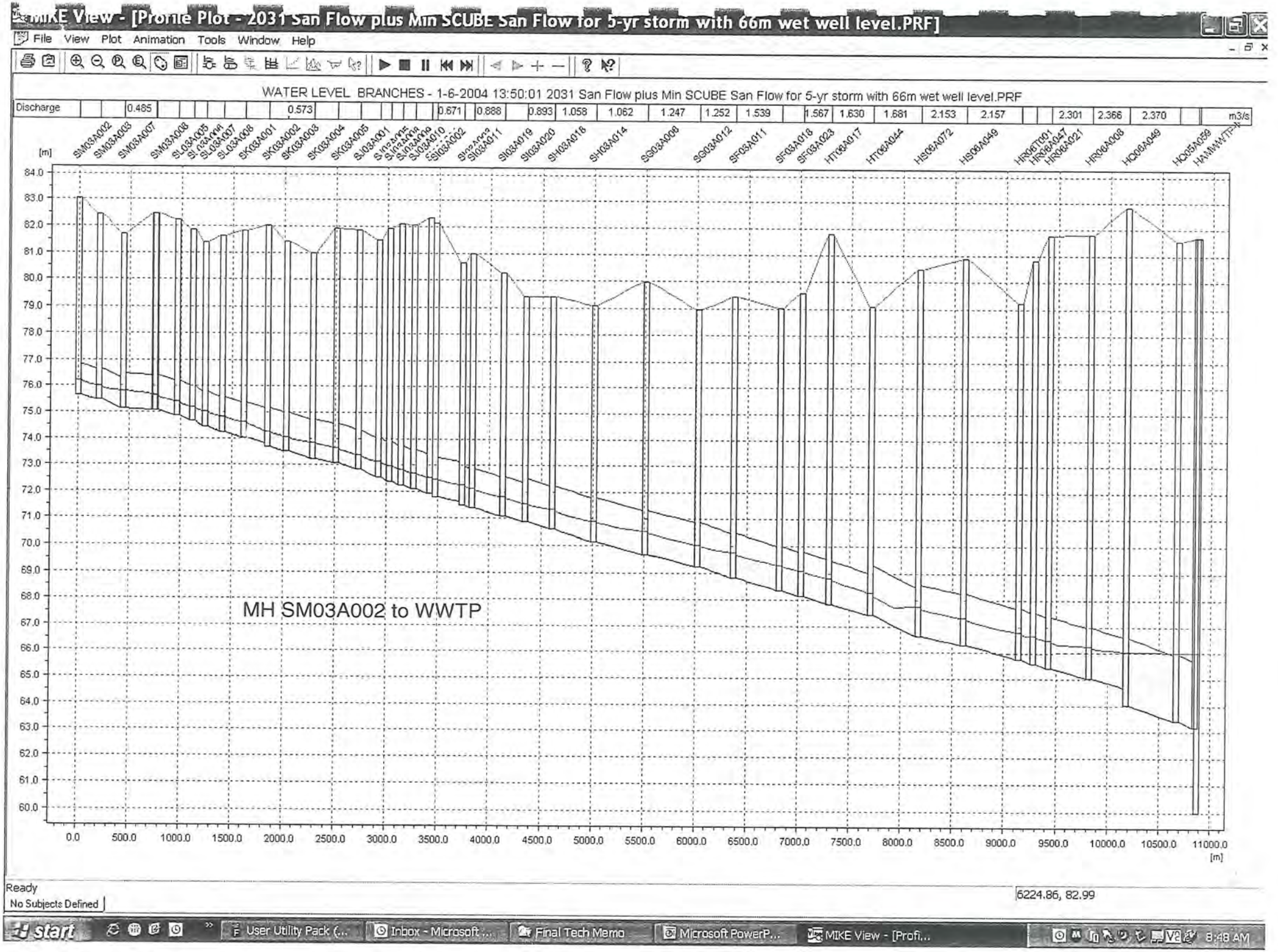

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 13:40:01 2031 San Flow plus Max SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge
0.615
0.705
0.805
1.022
1.028
1.193
1.198
1.382
1.385
1.669
1.693
1.755
1.803
2.290
2.293
2.436
2.505
2.505
m3/s
[m]
SM03A002
SM03A003
SM03A007
SM03A008
SL03A005
SL03A006
SL03A007
SL03A008
SK03A001
SK03A002
SK03A003
SK03A004
SK03A005
SJ03A001
SJ03A010
SJ03A002
SI03A011
SI03A019
SI03A020
SH03A016
SH03A014
SG03A006
SG03A012
SF03A011
SF03A018
SF03A023
HT06A017
HT06A044
HS06A072
HS06A049
HR06T001
HR06A047
HR06A021
HR06A008
HQ06A049
HQ05A059
HAMMWTP
84.0
83.0
82.0
81.0
80.0
79.0
78.0
77.0
76.0
75.0
74.0
73.0
72.0
71.0
70.0
69.0
68.0
67.0
66.0
65.0
64.0
63.0
62.0
61.0
60.0
MH SM03A002 to WWTP
0.0
500.0
1000.0
1500.0
2000.0
2500.0
3000.0
3500.0
4000.0
4500.0
5000.0
5500.0
6000.0
6500.0
7000.0
7500.0
8000.0
8500.0
9000.0
9500.0
10000.0
10500.0
11000.0
[m]
Ready
No Subjects Defined
6758.95, 81.95
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:42 AM

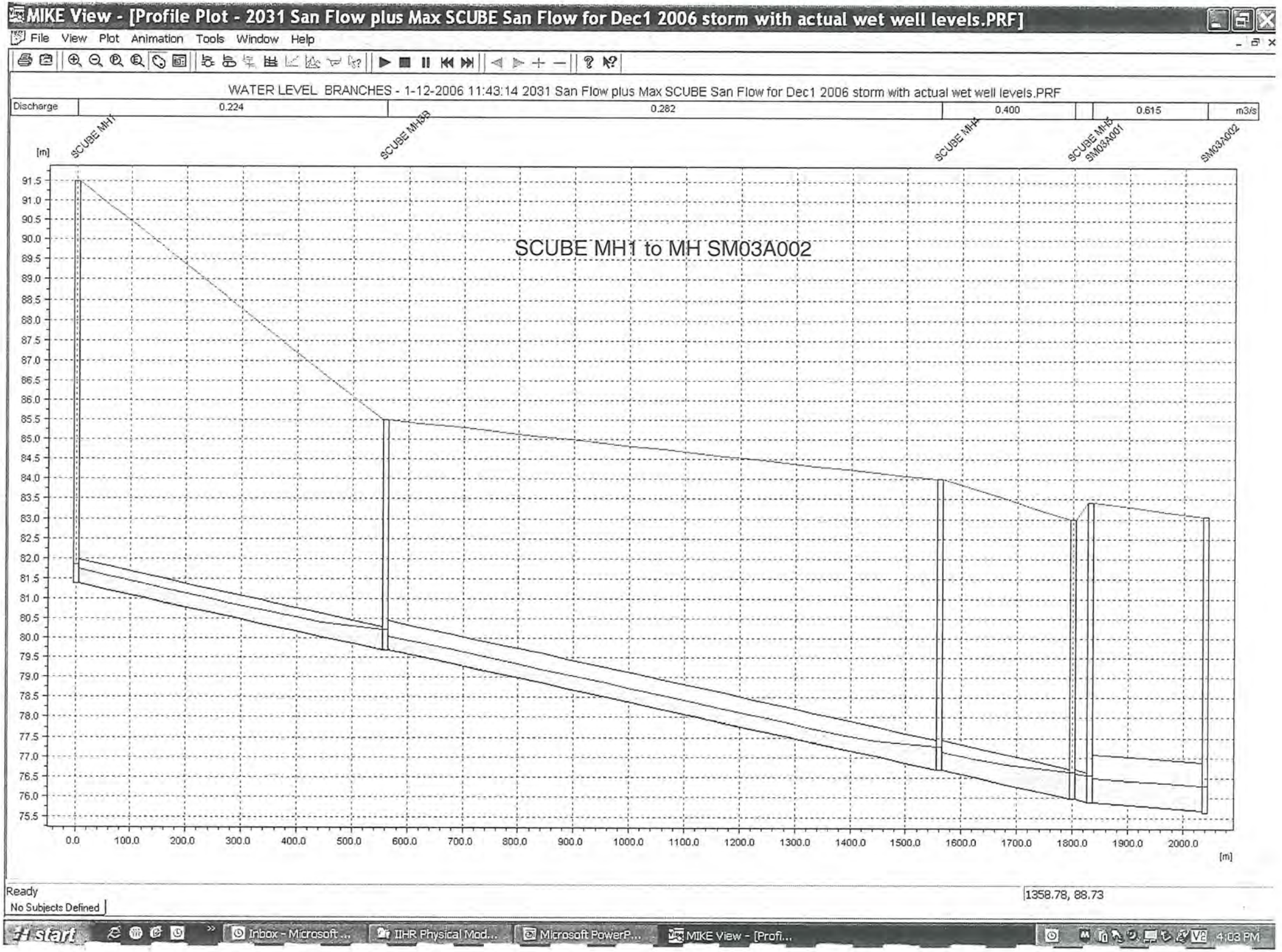

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge
0.165
0.198
0.285
0.516
m3/s
SCUBE MH1
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH1 to MH SM03A002
[m]
Ready
No Subjects Defined
1212.55, 89.95
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:43 AM

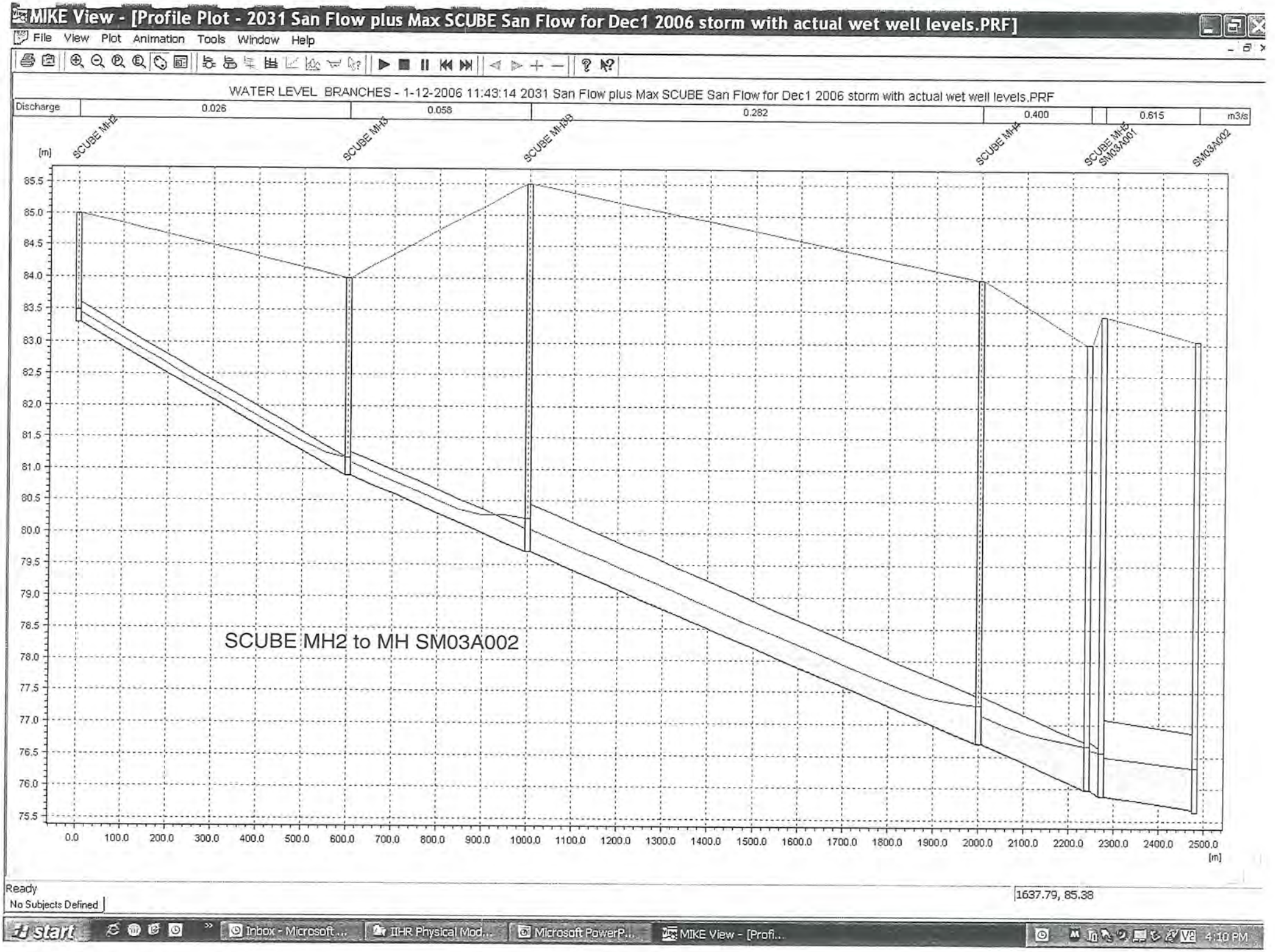

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge
0.014
0.033
0.198
0.285
0.516
m3/s
SCUBE MH2
SCUBE MH3
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH2 to MH SM03A002
[m]
Ready
No Subjects Defined
1877.48, 84.96
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:44 AM

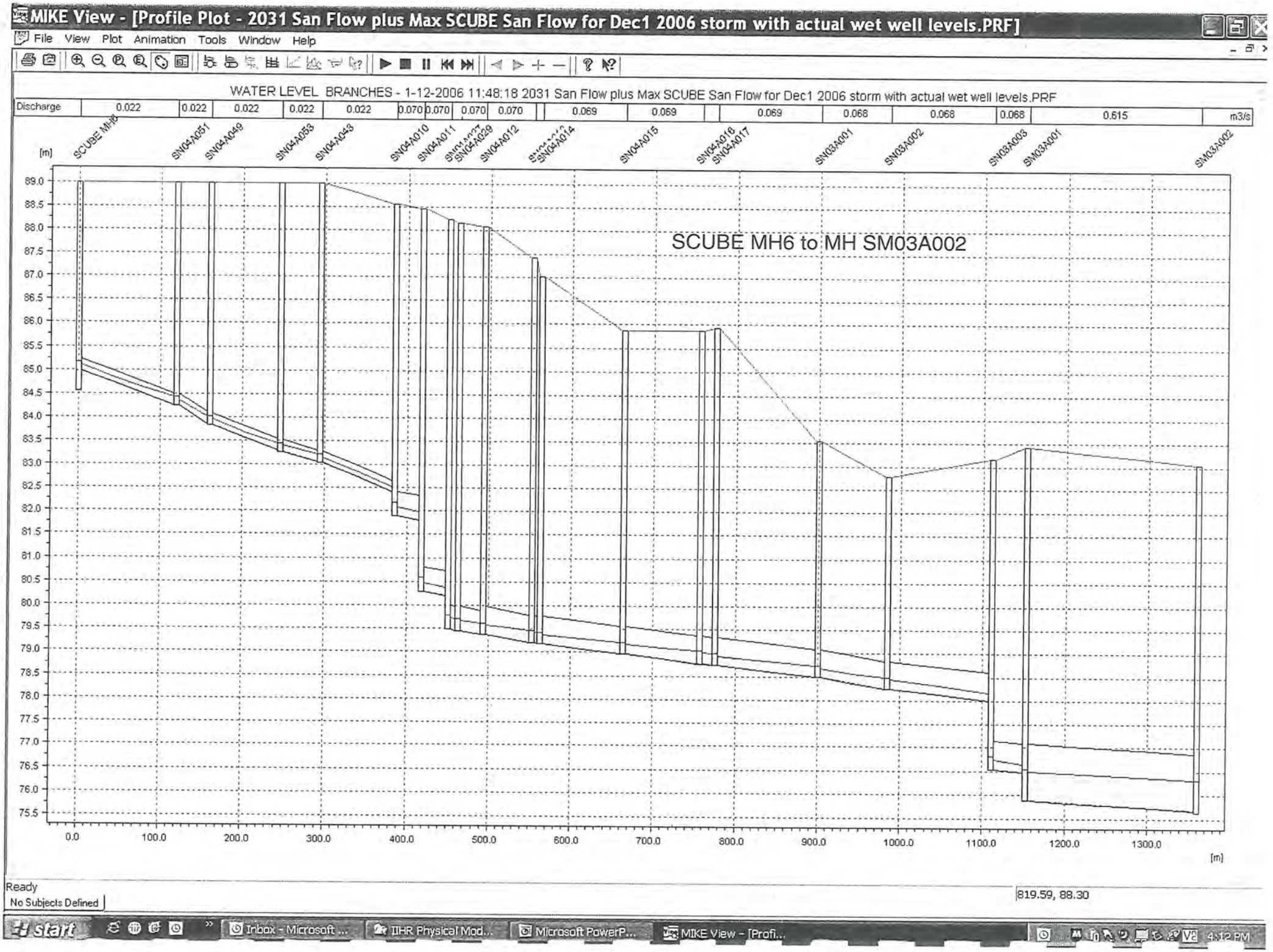

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge
0.014
0.014
0.014
0.014
0.014
0.070
0.070
0.071
0.072
0.074
0.075
0.077
0.078
0.078
0.078
0.516
m3/s
[m]
SCUBE MH6
SN04A051
SN04A049
SN04A053
SN04A043
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
SCUBE MH6 to MH SM03A002
89.0
88.5
88.0
87.5
87.0
86.5
86.0
85.5
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
[m]
Ready
No Subjects Defined
942.32, 87.48
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:45 AM

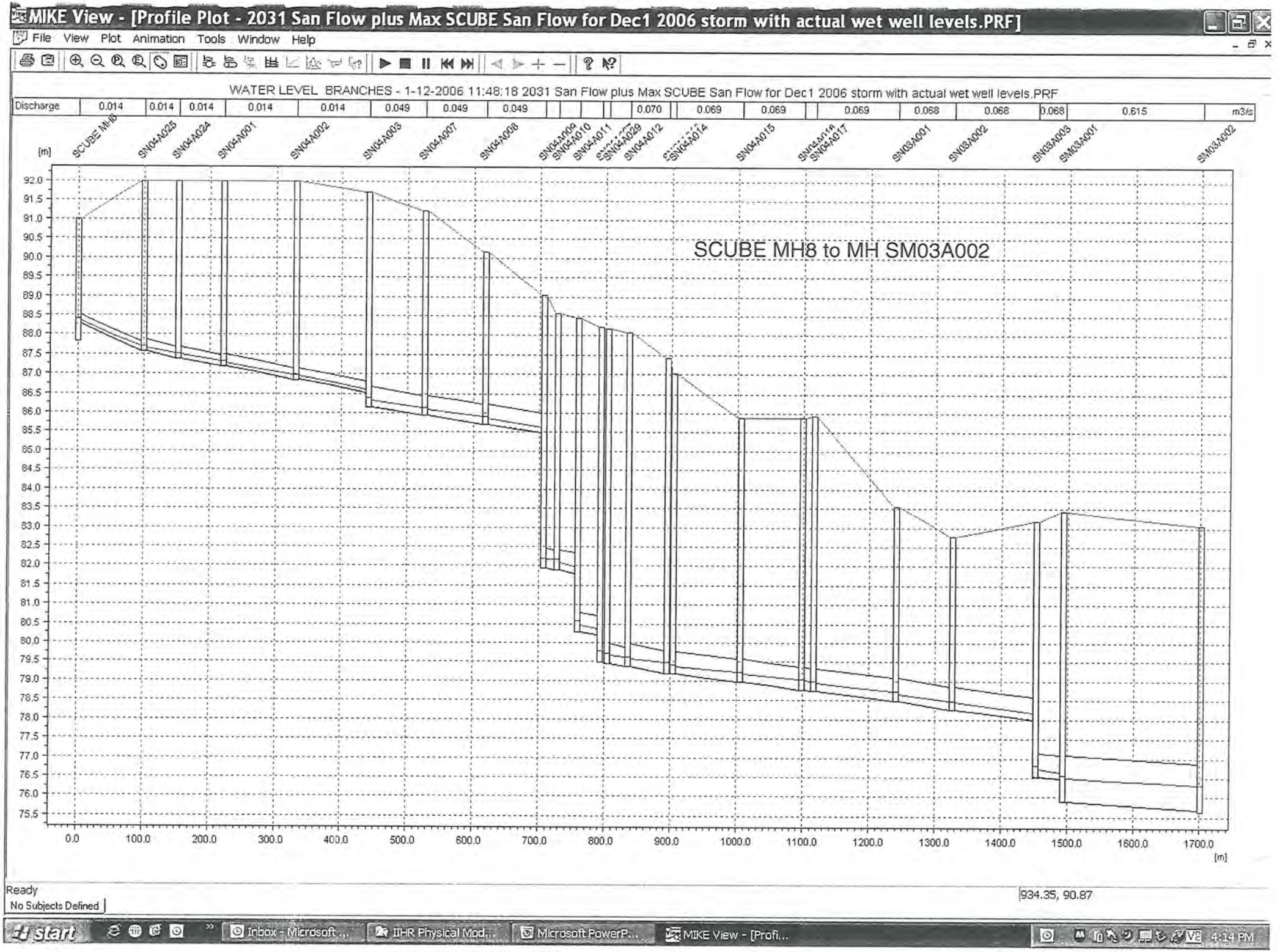

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 12:19:54 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge 0.009 0.009 0.009 0.009 0.009 0.052 0.053 0.055 0.072 0.074 0.075 0.077 0.078 0.078 0.078 0.516 m3/s
SCUBE MH8
SN04A025
SN04A024
SN04A001
SN04A002
SN04A003
SN04A007
SN04A008
SN04A009
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
[m]
SCUBE MH8 to MH SM03A002
92.0 91.5 91.0 90.5 90.0 89.5 89.0 88.5 88.0 87.5 87.0 86.5 86.0 85.5 85.0 84.5 84.0 83.5 83.0 82.5 82.0 81.5 81.0 80.5 80.0 79.5 79.0 78.5 78.0 77.5 77.0 76.5 76.0 75.5
0.0 100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0
[m]
Ready
No Subjects Defined
1037.11, 91.41
User Utility Pack (... Inbox - Microsoft Final Tech Memo Microsoft PowerP... MIKE View - [Profi...

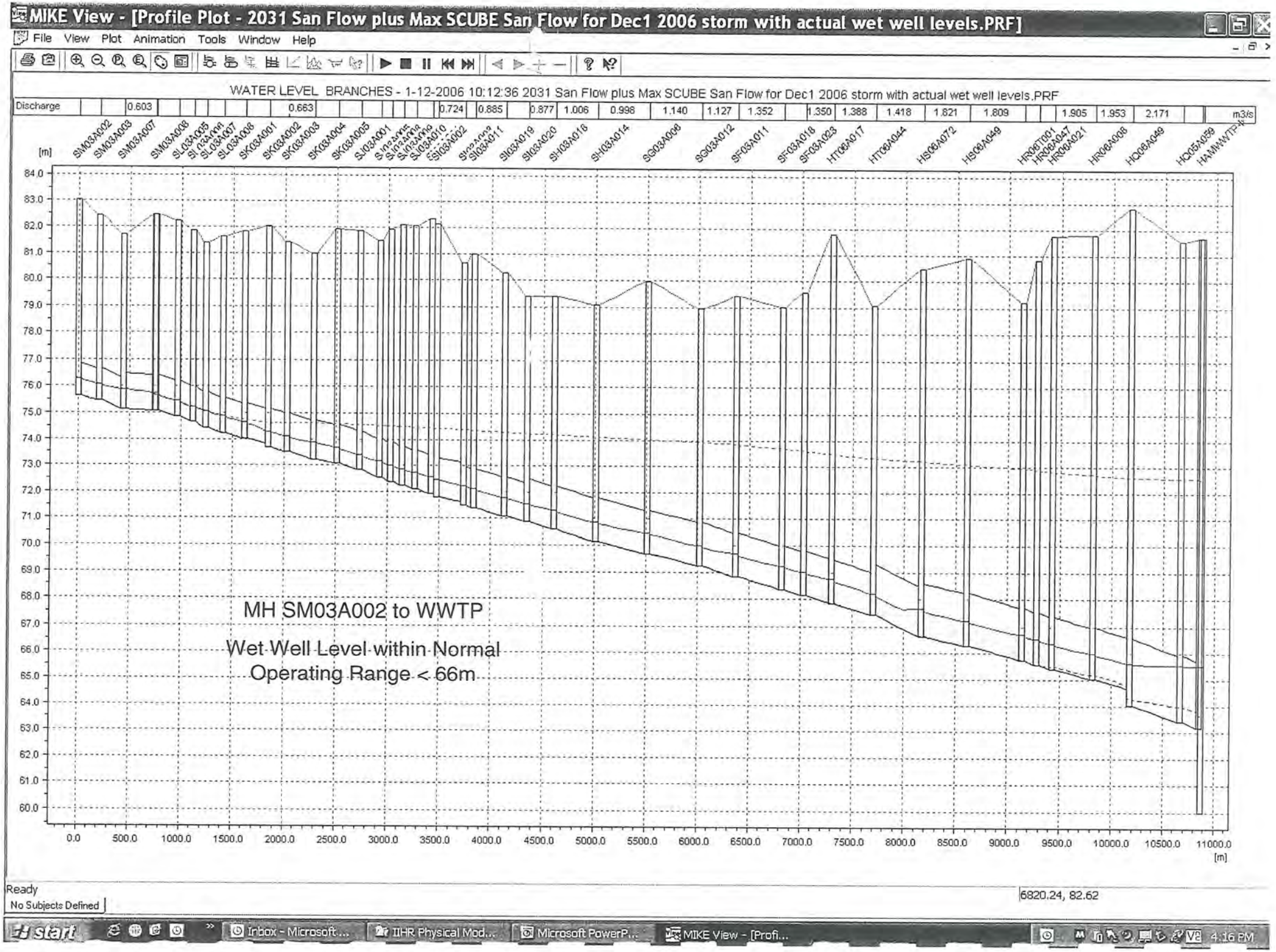

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-6-2004 13:50:01 2031 San Flow plus Min SCUBE San Flow for 5-yr storm with 66m wet well level.PRF
Discharge
0.485
0.573
0.671
0.888
0.893
1.058
1.062
1.247
1.252
1.539
1.567
1.630
1.681
2.153
2.157
2.301
2.366
2.370
m3/s
[m]
MH SM03A002 to WWTP
[m]
Ready
No Subjects Defined
6224.86, 82.99
start
User Utility Pack (...
Inbox - Microsoft ...
Final Tech Memo
Microsoft PowerP...
MIKE View - [Profi...
8:48 AM

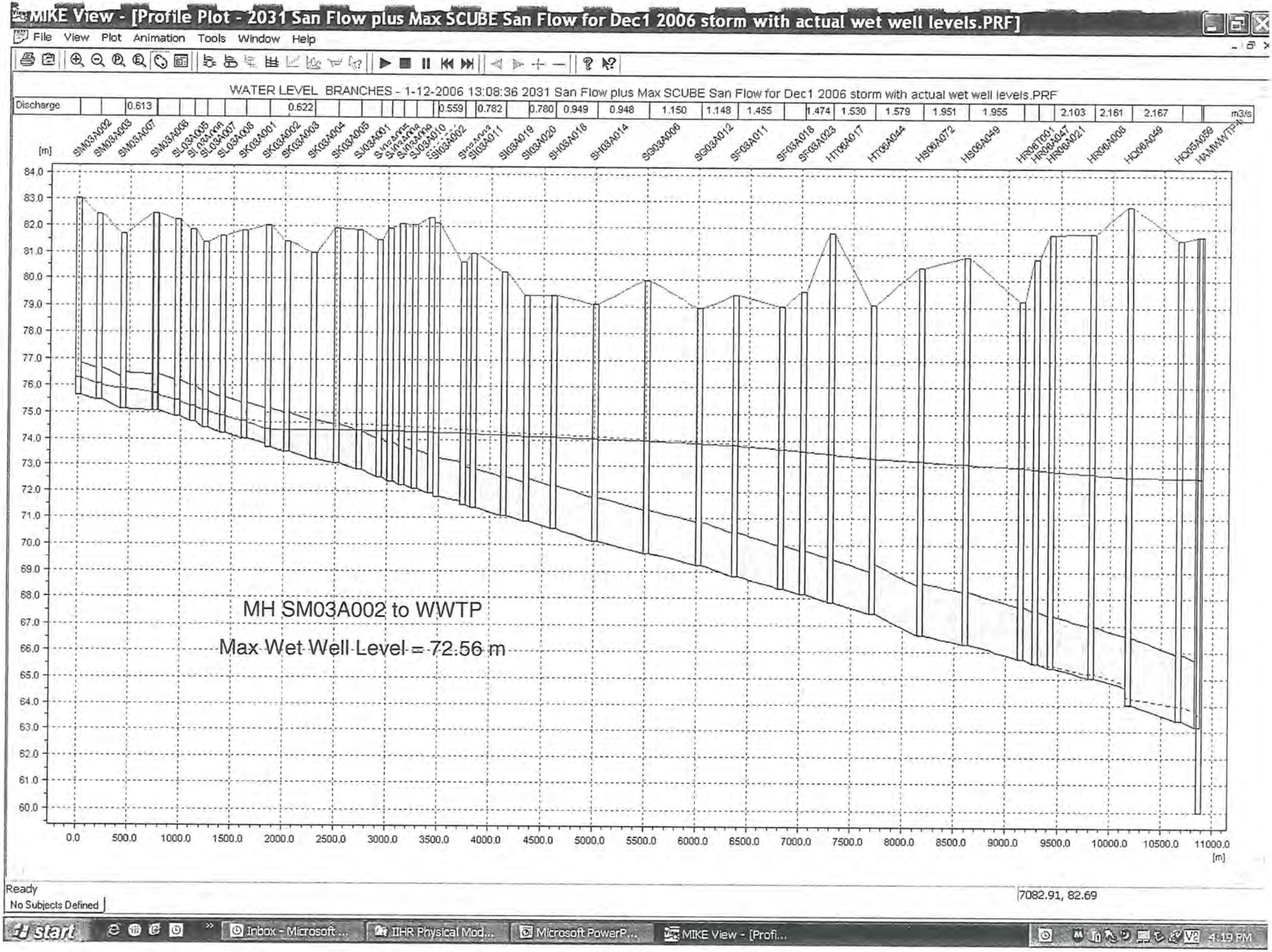

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:43:14 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.224
0.282
0.400
0.615
m3/s
SCUBE MH1
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH1 to MH SM03A002
[m]
Ready
No Subjects Defined
1358.78, 88.73
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:03 PM

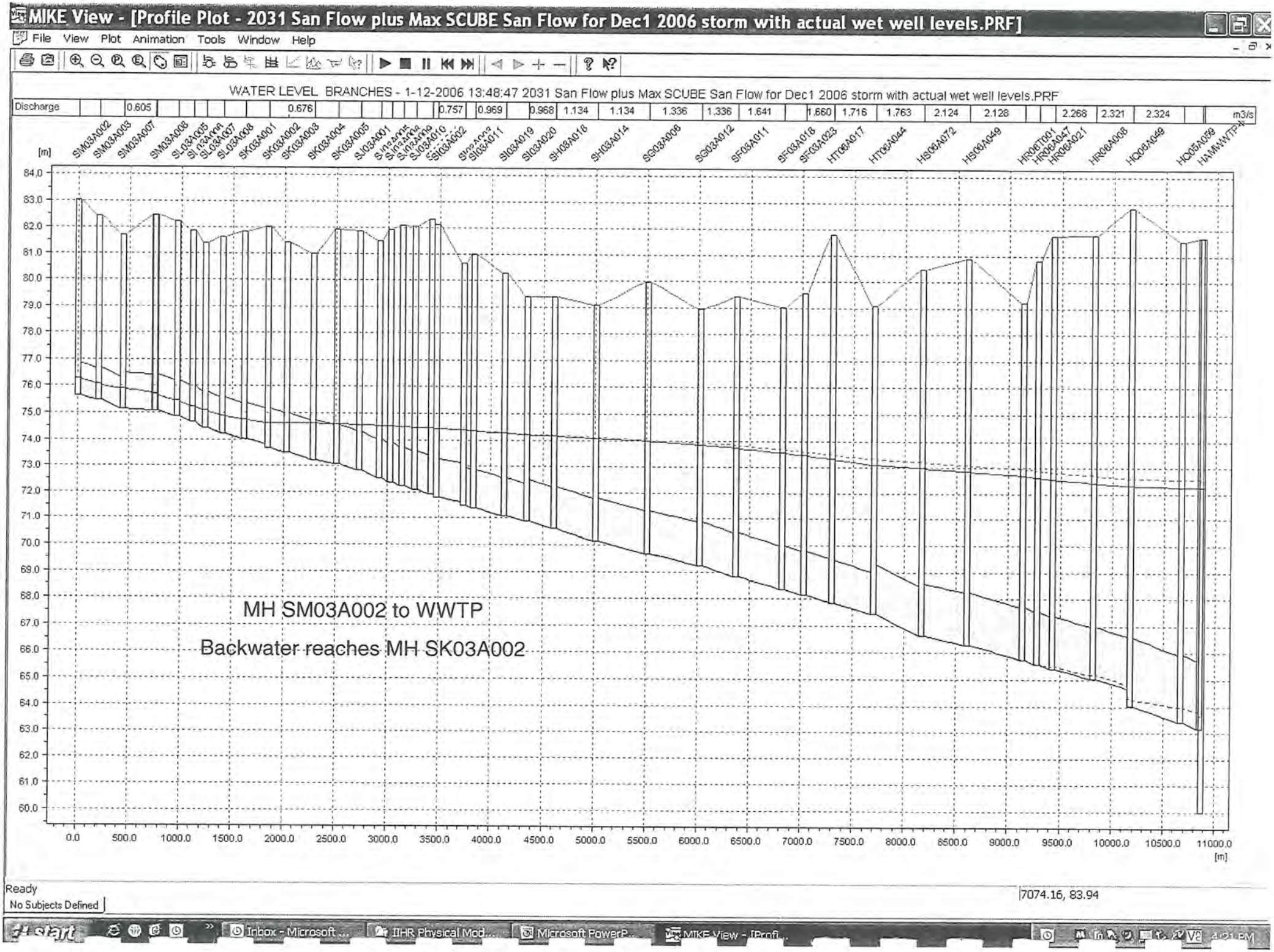

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:43:14 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.026
0.058
0.282
0.400
0.615
m3/s
SCUBE MH2
SCUBE MH3
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH2 to MH SM03A002
[m]
Ready
No Subjects Defined
1637.79, 85.38
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:10 PM

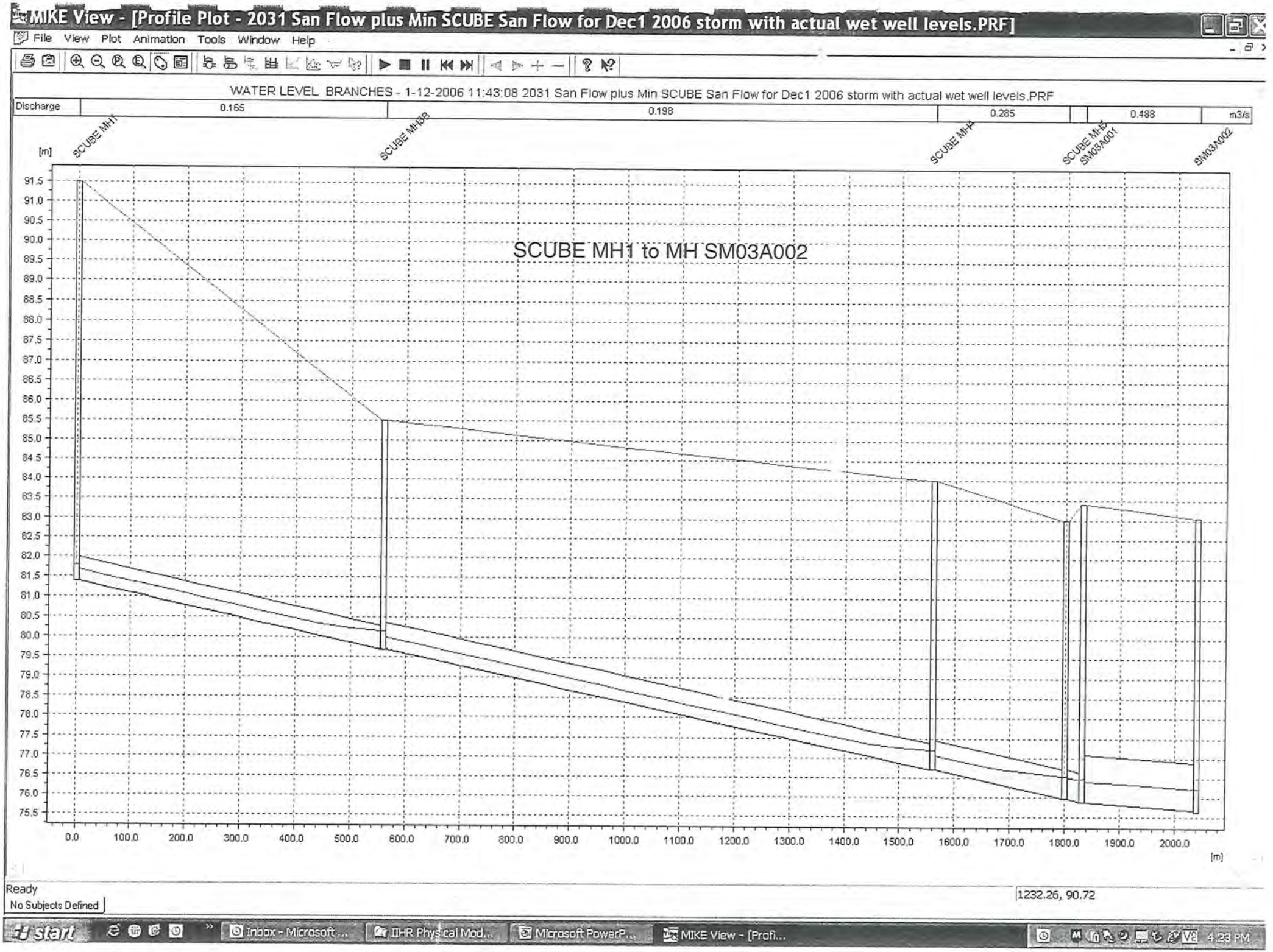

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:48:18 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.022
0.069
0.068
0.615
m3/s
[m]
SCUBE MH6
SN04A051
SN04A049
SN04A053
SN04A043
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
SCUBE MH6 to MH SM03A002
89.0
88.5
88.0
87.5
87.0
86.5
86.0
85.5
85.0
84.5
84.0
83.5
83.0
82.5
82.0
81.5
81.0
80.5
80.0
79.5
79.0
78.5
78.0
77.5
77.0
76.5
76.0
75.5
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
[m]
Ready
No Subjects Defined
819.59, 88.30
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:12 PM

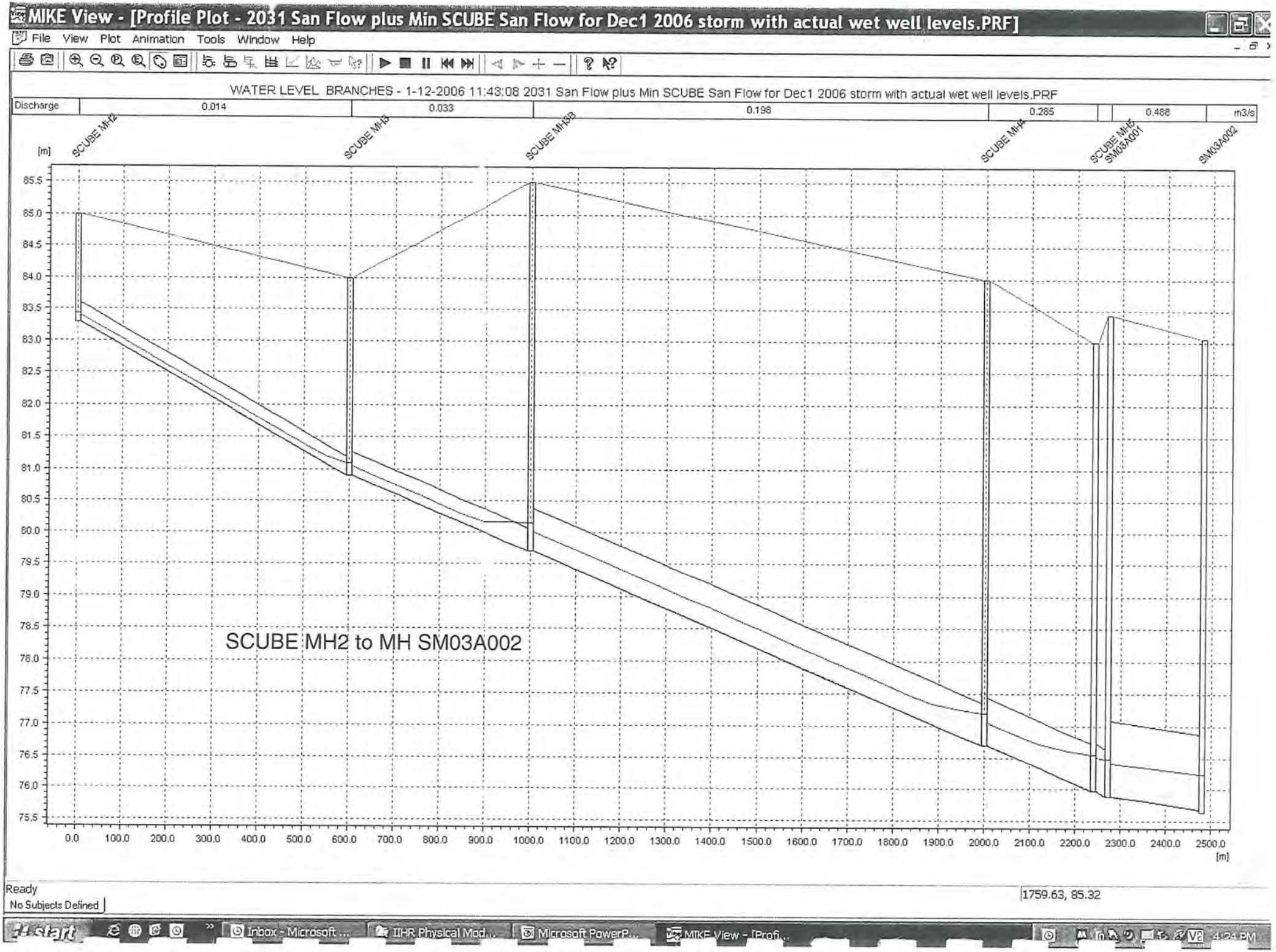

MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:48:18 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.014 0.014 0.014 0.014 0.014 0.049 0.049 0.049 0.070 0.069 0.069 0.069 0.068 0.068 0.068 0.615 m3/s
SCUBE MH8
SN04A025
SN04A024
SN04A001
SN04A002
SN04A003
SN04A007
SN04A008
SN04A009
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
[m]
SCUBE MH8 to MH SM03A002
92.0 91.5 91.0 90.5 90.0 89.5 89.0 88.5 88.0 87.5 87.0 86.5 86.0 85.5 85.0 84.5 84.0 83.5 83.0 82.5 82.0 81.5 81.0 80.5 80.0 79.5 79.0 78.5 78.0 77.5 77.0 76.5 76.0 75.5
0.0 100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0
[m]
Ready
No Subjects Defined
934.35, 90.87
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:14 PM


MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 10:12:36 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
m3/s
[m]
MH SM03A002 to WWTP
Wet Well Level within Normal Operating Range < 66m
[m]
Ready
No Subjects Defined
6820.24, 82.62
start
Inbox - Microsoft...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:16 PM


MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 13:08:36 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.613
0.622
0.559
0.782
0.780
0.949
0.948
1.150
1.148
1.455
1.474
1.530
1.579
1.951
1.955
2.103
2.161
2.167
m3/s
[m]
SM03A002
SM03A003
SM03A007
SM03A008
SM03A005
SM03A006
SM03A007
SL03A008
SK03A001
SK03A002
SK03A003
SK03A004
SK03A005
SJ03A001
SI03A002
SI03A011
SI03A019
SI03A020
SH03A018
SH03A014
SG03A006
SG03A012
SF03A011
SF03A016
SF03A023
HT06A017
HT06A044
HS06A072
HS06A049
HR06T001
HR06A047
HR06A021
HR06A008
HQ06A049
HQ05A059
HAMMWTP
84.0
83.0
82.0
81.0
80.0
79.0
78.0
77.0
76.0
75.0
74.0
73.0
72.0
71.0
70.0
69.0
68.0
67.0
66.0
65.0
64.0
63.0
62.0
61.0
60.0
0.0
500.0
1000.0
1500.0
2000.0
2500.0
3000.0
3500.0
4000.0
4500.0
5000.0
5500.0
6000.0
6500.0
7000.0
7500.0
8000.0
8500.0
9000.0
9500.0
10000.0
10500.0
11000.0
[m]
MH SM03A002 to WWTP
Max Wet Well Level = 72.56 m
Ready
No Subjects Defined
7082.91, 82.69
start
Inbox - Microsoft...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:19 PM


MIKE View - [Profile Plot - 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 13:48:47 2031 San Flow plus Max SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.605
0.676
0.757
0.969
0.968
1.134
1.134
1.336
1.336
1.641
1.660
1.716
1.763
2.124
2.128
2.268
2.321
2.324
m3/s
[m]
SM03A002
SM03A003
SM03A007
SM03A008
SL03A005
SL03A004
SL03A007
SL03A008
SK03A001
SK03A002
SK03A003
SK03A004
SK03A005
SJ03A001
SJ03A005
SJ03A004
SJ03A006
SJ03A010
SI03A002
SI03A003
SI03A011
SI03A019
SI03A020
SH03A018
SH03A014
SG03A006
SG03A012
SF03A011
SF03A018
SF03A023
HT06A017
HT06A044
HS06A072
HS06A049
HR06T001
HR06A047
HR06A021
HR06A008
HQ06A049
HQ05A059
HAMMWTP-N
84.0
83.0
82.0
81.0
80.0
79.0
78.0
77.0
76.0
75.0
74.0
73.0
72.0
71.0
70.0
69.0
68.0
67.0
66.0
65.0
64.0
63.0
62.0
61.0
60.0
0.0
500.0
1000.0
1500.0
2000.0
2500.0
3000.0
3500.0
4000.0
4500.0
5000.0
5500.0
6000.0
6500.0
7000.0
7500.0
8000.0
8500.0
9000.0
9500.0
10000.0
10500.0
11000.0
[m]
MH SM03A002 to WWTP
Backwater reaches MH SK03A002
Ready
No Subjects Defined
7074.16, 83.94
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:21 PM


MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:43:08 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.165
0.198
0.285
0.488
m3/s
SCUBE MH1
SCUBE MH3B
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH1 to MH SM03A002
[m]
Ready
No Subjects Defined
1232.26, 90.72
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:23 PM


MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:43:08 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.014
0.033
0.198
0.285
0.488
m3/s
SCUBE MH2
SCUBE MH3
SCUBE MH3R
SCUBE MH4
SCUBE MH5
SM03A001
SM03A002
[m]
SCUBE MH2 to MH SM03A002
[m]
Ready
No Subjects Defined
1759.63, 85.32
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:24 PM

MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]

File View Plot Animation Tools Window Help

WATER LEVEL BRANCHES - 1-12-2006 11:48:10 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF

Discharge	0.014	0.014	0.014	0.014	0.014	0.058	0.057	0.057	0.057	0.057	0.057	0.056	0.056	0.056	0.055	0.488	m3/s

SCUBE MH6 SN04A051 SN04A049 SN04A053 SN04A043 SN04A010 SN04A011 SN04A029 SN04A012 SN04A014 SN04A015 SN04A016 SN04A017 SN03A001 SN03A002 SN03A003 SM03A001 SM03A002

[m]

SCUBE MH6 to MH SM03A002

89.0 88.5 88.0 87.5 87.0 86.5 86.0 85.5 85.0 84.5 84.0 83.5 83.0 82.5 82.0 81.5 81.0 80.5 80.0 79.5 79.0 78.5 78.0 77.5 77.0 76.5 76.0 75.5

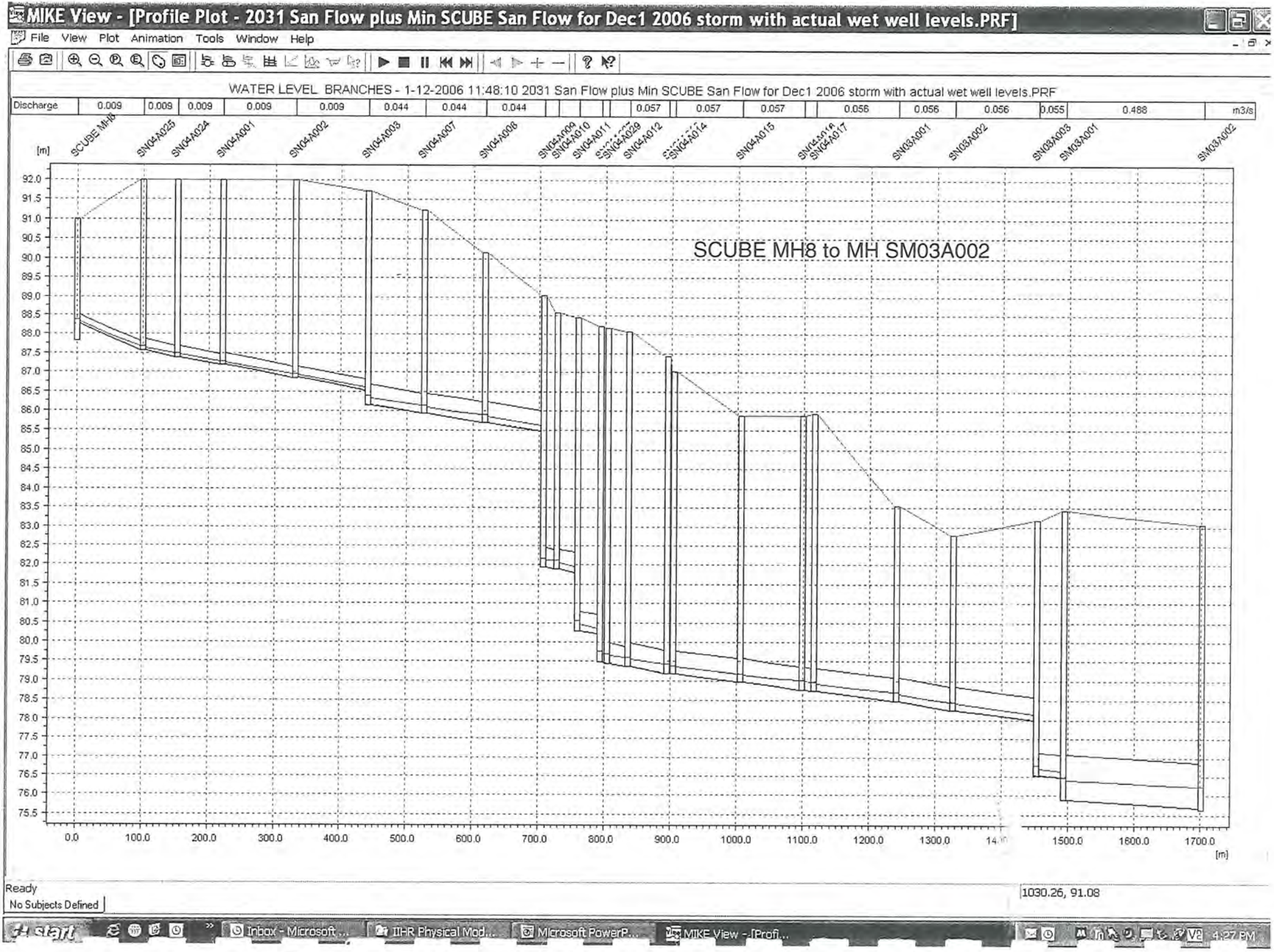
0.0 100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 [m]

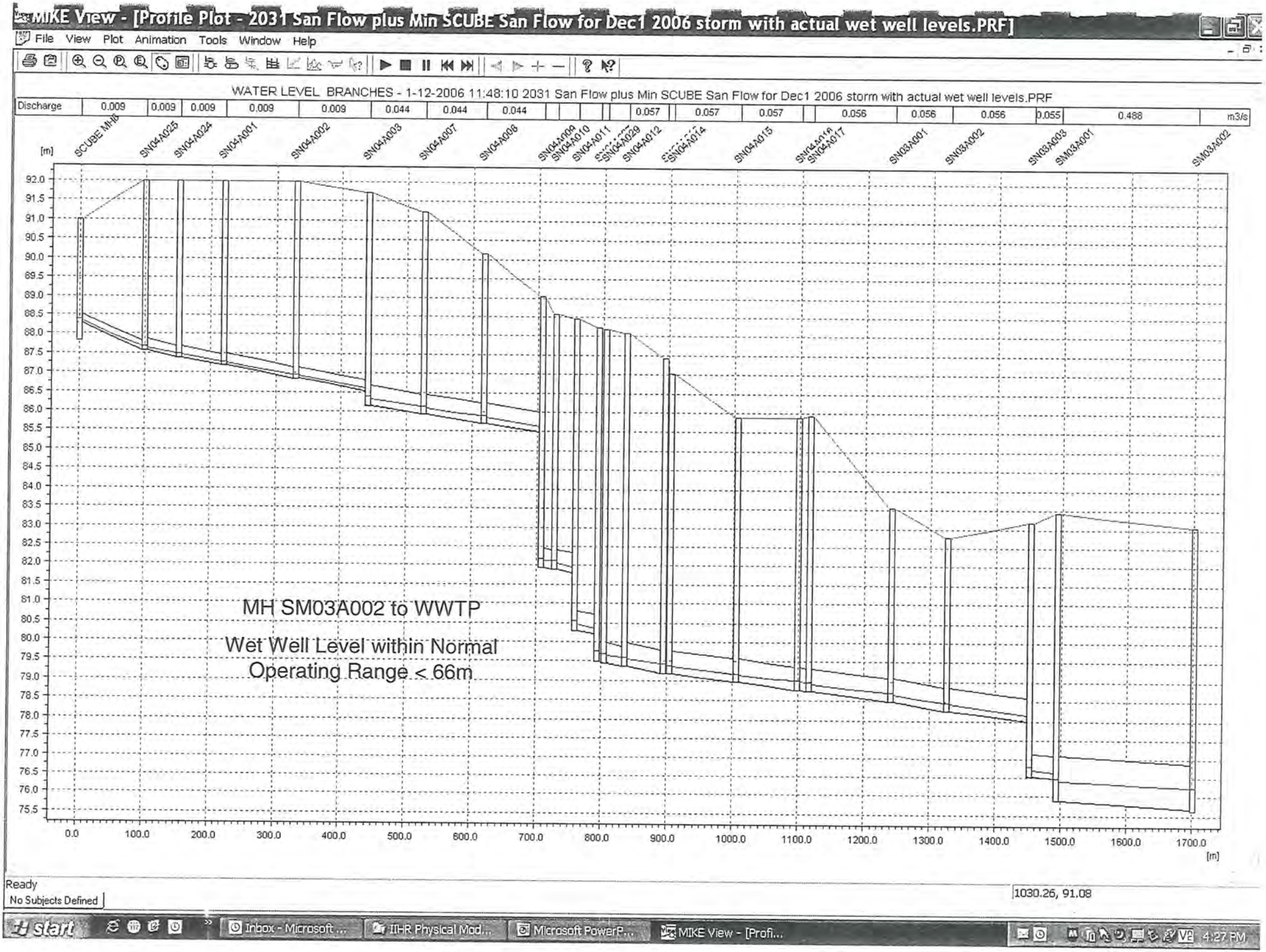
Ready

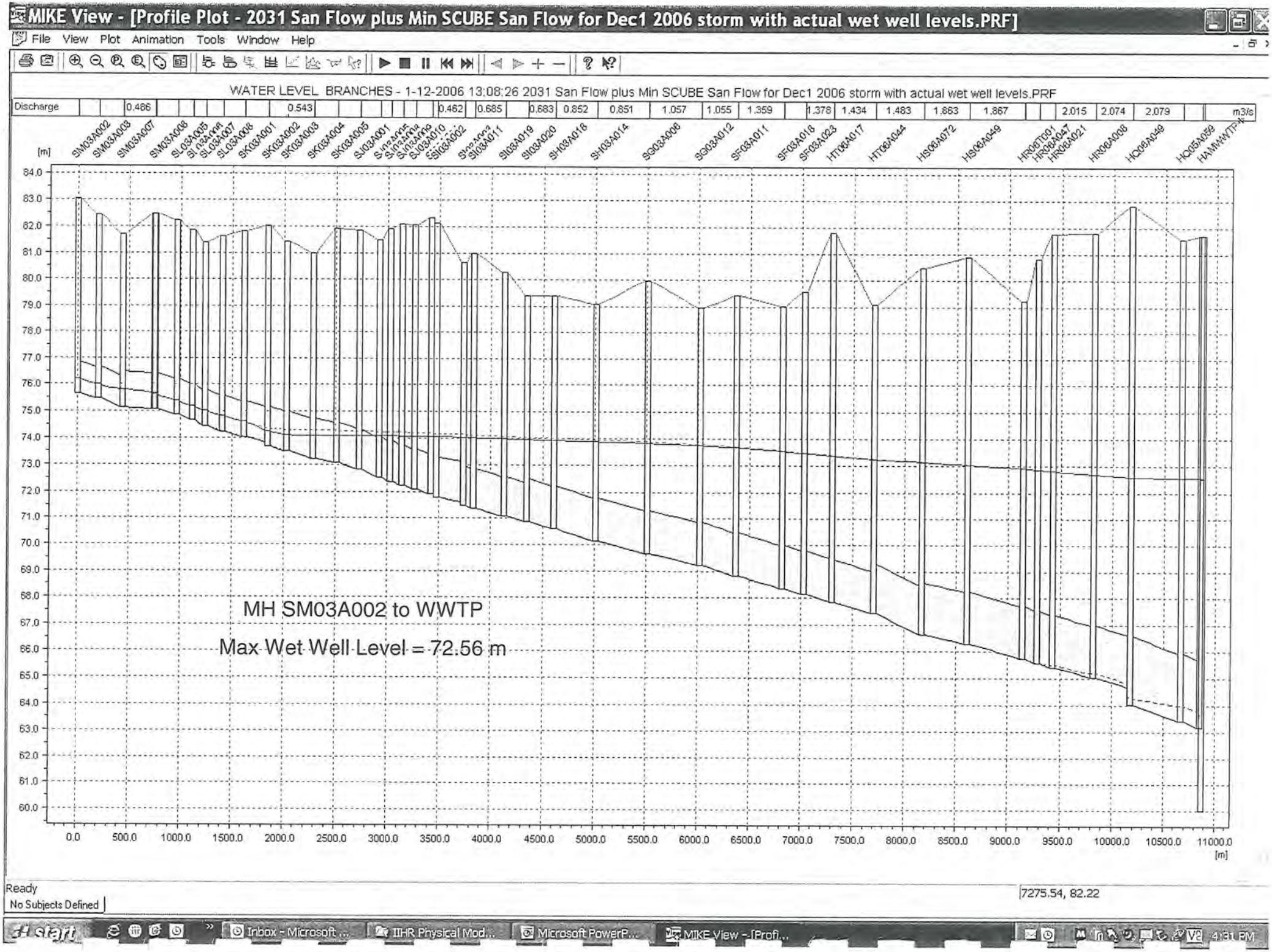
No Subjects Defined

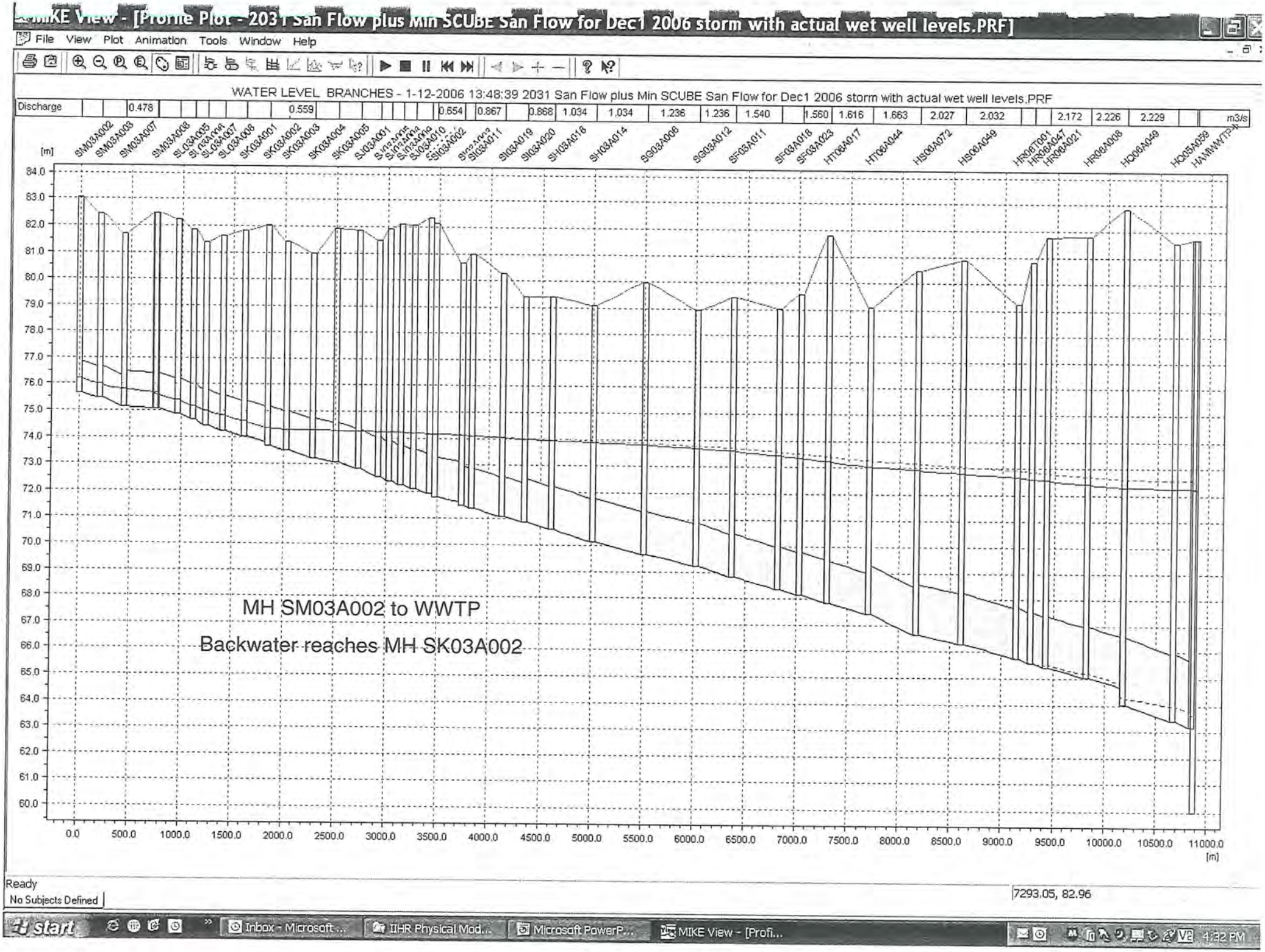
795.48, 87.77

start Inbox - Microsoft ... IIHR Physical Mod... Microsoft PowerP... MIKE View - [Profi... 4:26 PM


MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:48:10 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.009 0.009 0.009 0.009 0.009 0.044 0.044 0.044 0.057 0.057 0.057 0.056 0.056 0.056 0.055 0.488
m3/s
[m]
SCUBE MH8
SN04A025
SN04A024
SN04A001
SN04A002
SN04A003
SN04A007
SN04A008
SN04A009
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
SCUBE MH8 to MH SM03A002
[m]
Ready
No Subjects Defined
1030.26, 91.08
Start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:27 PM


MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 11:48:10 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.009 0.009 0.009 0.009 0.009 0.044 0.044 0.044 0.057 0.057 0.057 0.056 0.056 0.056 0.055 0.488 m3/s
[m]
SCUBE MHB
SN04A025
SN04A024
SN04A001
SN04A002
SN04A003
SN04A007
SN04A006
SN04A009
SN04A010
SN04A011
SN04A029
SN04A012
SN04A014
SN04A015
SN04A016
SN04A017
SN03A001
SN03A002
SN03A003
SM03A001
SM03A002
92.0 91.5 91.0 90.5 90.0 89.5 89.0 88.5 88.0 87.5 87.0 86.5 86.0 85.5 85.0 84.5 84.0 83.5 83.0 82.5 82.0 81.5 81.0 80.5 80.0 79.5 79.0 78.5 78.0 77.5 77.0 76.5 76.0 75.5
0.0 100.0 200.0 300.0 400.0 500.0 600.0 700.0 800.0 900.0 1000.0 1100.0 1200.0 1300.0 1400.0 1500.0 1600.0 1700.0
[m]
MH SM03A002 to WWTP
Wet Well Level within Normal Operating Range < 66m
Ready
No Subjects Defined
1030.26, 91.08
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:27 PM


MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 13:08:26 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.486
0.543
0.462
0.685
0.683
0.852
0.851
1.057
1.055
1.359
1.378
1.434
1.483
1.863
1.867
2.015
2.074
2.079
m3/s
[m]
SM03A002
SM03A003
SM03A007
SM03A008
SK03A001
SK03A002
SK03A003
SK03A004
SK03A005
SJ03A001
SI03A019
SI03A020
SH03A016
SH03A014
SG03A006
SG03A012
SF03A011
SF03A018
SF03A023
HT06A017
HT06A044
HS06A072
HS06A049
HR06T001
HR06A047
HR06A021
HR06A006
HC06A049
HC05A059
HAMMAWTP
MH SM03A002 to WWTP
Max Wet Well Level = 72.56 m
[m]
Ready
No Subjects Defined
7275.54, 82.22
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:31 PM


MIKE View - [Profile Plot - 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF]
File View Plot Animation Tools Window Help
WATER LEVEL BRANCHES - 1-12-2006 13:48:39 2031 San Flow plus Min SCUBE San Flow for Dec1 2006 storm with actual wet well levels.PRF
Discharge
0.478
0.559
0.654
0.867
0.868
1.034
1.034
1.236
1.236
1.540
1.560
1.616
1.663
2.027
2.032
2.172
2.226
2.229
m3/s
[m]
SM03A002
SM03A003
SM03A007
SM03A008
SK03A001
SK03A002
SK03A003
SK03A004
SK03A005
SI03A001
SI03A019
SI03A020
SH03A016
SH03A014
SG03A008
SG03A012
SF03A011
SF03A018
SF03A023
HT06A017
HT06A044
HS06A072
HS06A049
HR06T001
HR06A047
HR06A021
HR06A008
HQ06A049
HQ05A039
HAMMWTP
MH SM03A002 to WWTP
Backwater reaches MH SK03A002
[m]
Ready
No Subjects Defined
7293.05, 82.96
start
Inbox - Microsoft ...
IIHR Physical Mod...
Microsoft PowerP...
MIKE View - [Profi...
4:32 PM

Costs of Water Servicing Alternatives

Note: Where applicable, restoration costs have been included for all servicing alternatives.

Water Servicing Alternative Solution No. 1

Watermain				
Street	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
South Service Road	200	410	620	254,200
South Service Road	300	569	750	426,750
Total Watermain for Alternative Solution No. 1				**680,950**

Total for Alternative Solution No. 1	**$ 680,950**

Water Servicing Alternative Solution No. 2

Watermain				
Street	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
CNR Lands	300	569	800	455,200
South Service Road	200	410	620	254,200
Total Watermain for Alternative Solution No. 2				**709,400**

Land Acquisition			
Street	**Unit Cost ($/m^2)**	**Area (m^2)**	**Cost ($)**
CNR Lands (6 m Width)	4.94	4800	23,722

Total for Alternative Solution No. 2	**$ 733,122**

Water Servicing Alternative Solution No. 3

Watermain				
Street	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
CNR Lands	300	569	800	455,200
Pr. Easement from Service Road to CNR Lands	200	410	230	94,300
South Service Road	200	410	620	254,200
Total Watermain for Alternative Solution No. 3				**803,700**

Land Acquisition			
Street	**Unit Cost ($/m^2)**	**Area (m^2)**	**Cost ($)**
CNR Lands (6 m Width)	4.94	4800	23722
Pr. Easement from Service Road to CNR Lands (6m Width)	4.94	1380	6820
Total Land Acquisition for Alternative Solution No. 3			**30,542**

Total for Alternative Solution No. 3	**$ 834,242**

Costs of Wastewater Servicing Alternatives

Note: Where applicable, restoration costs have been included for all servicing alternatives.

Wastewater Servicing Alternative Solution No. 1

Wastewater Pumping Station (Including Land Acquisition Costs)	
Street	**Cost ($)**
South Service Road	180,000

Gravity Sewer					
Street	**Depth**	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
Fifty Road	3 m to 5 m	600	613	130	79,690
Service Road	0 m to 2 m	375	507	430	218,010
South Service Road	3 m to 5 m	375	507	510	258,570
South Service Road	3 m to 5 m	600	613	950	582,350
South Service Road	6 m to 10 m	750	2,012	260	523,120
Total Gravity Sewer for Alternative Solution No. 1					**1,661,740**

Sanitary Forcemain				
Street	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
South Service Road	150	277	550	152,350

Total for Alternative Solution No. 1	**1,994,090**

Wastewater Servicing Alternative Solution No. 2

Wastewater Pumping Station (Including Land Acquisition Costs)	
Street	**Cost ($)**
CNR Lands	180,000

Gravity Sewer					
Street	**Depth**	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
CNR Lands	3 m to 5 m	375	507	410	207,870
CNR Lands	3 m to 5 m	600	613	220	134,860
CNR Lands	3 m to 5 m	750	752	580	436,160
South Service Road	6 m to 10 m	750	2,012	260	523,120
Winona Road	3 m to 5 m	750	752	430	323,360
Total Gravity Sewer for Alternative Solution No. 2					**1,625,370**

Sanitary Forcemain				
Street	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
CNR Lands	150	277	430	119,110

Land Acquisition			
Street	**Unit Cost ($/m^2)**	**Area (m^2)**	**Cost ($)**
CNR Lands (9 m Width)	4.94	14760	72,945.52

Total for Alternative Solution No. 2	**1,997,426**

Wastewater Servicing Alternative Solution No. 3

Wastewater Pumping Station (Including Land Acquisition Costs)	
Street	**Cost ($)**
CNR Lands	180,000

Gravity Sewer					
Street	**Depth**	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
CNR Lands	3 m to 5 m	375	507	410	207,870
CNR Lands	3 m to 5 m	375	507	220	111,540
Fifty Road	3 m to 5 m	600	613	130	79,690
Service Road	0 m to 2 m	375	507	430	218,010
South Service Road	3 m to 5 m	750	752	950	714,400
South Service Road	6 m to 10 m	750	2,012	260	523,120
Total Gravity Sewer for Alternative Solution No. 3					**1,854,630**

Sanitary Forcemain				
Street	**Diameter (mm)**	**Unit Cost ($/m)**	**Length (m)**	**Cost ($)**
CNR Lands	150	277	430	119,110

Land Acquisition			
Street	**Unit Cost ($/m^2)**	**Area (m^2)**	**Cost ($)**
CNR Lands (9m Width)	4.94	9540	47,147.71

Total for Alternative Solution No. 3	**2,200,888**