Project Planning Report for the Environmental Science and Chemistry Building at University of Toronto Scarborough

March 29, 2013

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I. Executive Summary

UTSC continues to be a leader in delivering innovative and experiential learning opportunities that prepare graduates with the knowledge, skills and experience that will give them the advantage in an ever-changing, knowledge-based economy. As the student population continues to expand to meet system demands, UTSC requires additional facilities to accommodate both students and faculty. Since 2000, UTSC has experienced an unprecedented surge in enrolment that has transformed and expanded the campus to over 11,200 students. UTSC's growth targets would see an additional 1,900 new undergraduate students join the campus over the next four years. UTSC is also planning to double the number of graduate students conducting the majority of their research here. To keep pace with this expansion, an additional 73 FTE new faculty are to be hired, of which approximately 30% will require laboratory facilities.

At present, the campus cannot accommodate additional faculty requiring wet lab research facilities. To address this shortage, and to accommodate the expanding research culture and infrastructure needs at UTSC as a result of rapid student growth, including graduate student growth, a new science building is being proposed.

The most recent science facility, the Science Research Building (SRB), opened in 2008 and reached its capacity immediately upon opening. With the addition of the Environmental Science and Chemistry Building (ESC), UTSC will be able to keep pace with student and faculty requirements for research facilities. More to the point, a sophisticated new science facility will enable UTSC to solidify its growing reputation as a leading hub for scientific scholarship in Canada, and as a destination of choice for aspiring researchers of today and tomorrow.

In 2008/09 UTSC developed plans for a multi-phased Instructional Centre and Laboratory Complex. The first phase, the Instructional Centre (IC), funded through the Federal Government's Knowledge Infrastructure Program, opened in 2011 and provided new classroom and teaching spaces designed to meet the needs of two high demand programs (Management and Computer and Mathematical sciences). The facility also provided high-quality secondary spaces for non-wet lab and administrative departments. The new Environmental Science and Chemistry Building represents the second phase of this planned infrastructure project.

The new Environmental Science and Chemistry Building will become the scientific anchor for the North Campus development and will be home to the Department of Physical and Environmental Sciences (DPES). DPES is a multi-disciplinary and interdisciplinary department (Chemistry, Environmental Science, Physics and Astrophysics). The Environmental Science and Chemistry Building will house two of the three disciplines (Chemistry and Environmental Science and will serve as the hub for research and teaching in these two disciplines. It will be situated adjacent to the recently completed Instructional Centre. The Environmental Science and Chemistry Building will house a number of research and teaching laboratories, including a TRACES instrumentation centre and a Chemical store, with office and meeting space for DPES. It will also include other non-DPES spaces

including a student study room, a librarian office, a police office, and a catalyst centre (containing seminar rooms and multi-purpose bookable space).

The Environmental Science and Chemistry Building will have a gross area of 10,116 square metres (5058 nasm). The building is proposed to have 5 levels with a basement that is linked underground to the adjacent Instructional Centre. It will be designed to meet a minimum of LEED sliver standard as well as meet the Toronto Green Building Standard with a desire for Voluntary Tier 2.

The design and construction schedule for the Environmental Science and Chemistry Building target occupancy for July 2015.

II. Project Background

a) Membership

Bernie Kraatz, Professor, Chair of DPES, UT Scarborough (Co-Chair)
Andrew Arifuzzaman, Chief Administrative Officer, UT Scarborough (Co-Chair)
William Gough, Professor, Vice-Dean, Graduate Education and Program Development, UT Scarborough
Malcolm Campbell, Vice-Principal, Research, UT Scarborough
Roberta Fulthorpe, Professor Graduate Chair DPES, UT Scarborough
Julian Lowman, Professor, Physics and Astrophysics, UT Scarborough
Jim Derenzis, Director Facilities Management, UT Scarborough
Jeevan Kempson, Assistant Chief Administrative Officer, UT Scarborough
Therese Ludlow, Project Coordinator, PPSA, UT Scarborough
Matt Binnington, Graduate Student Representative, UT Scarborough
Andrew Zajch, Undergraduate Student Representative, UT Scarborough
George Phelps, Director, Project Development, U of T
Gail Milgrom, Director, Campus & Facilities Planning, U of T.
Lisa Neidrauer, Planner, Campus & Facilities Planning, U of T
Jeff Miller, Mechanical Engineer, Facilities Management
Hovan Stepanian, Project Manager, Facilities Management

b) Terms of Reference

1. Make recommendations for a detailed space program and functional layout for the Environmental Science and Chemistry Building at the University of Toronto Scarborough.

2. Identify the space program as it is related to the existing and approved academic plan at UTSC, taking into account the impact of approved and proposed program that are reflected in increasing faculty, student and staff complement. Plan to realize maximum flexibility of space to permit future allocation, as program needs change.

3. Demonstrate that the proposed space program will be consistent with the Council of Ontario Universities' and the University's own space standards.

4. Identify all deferred maintenance and items of infrastructure renewal for the buildings that are to be renovated.

5. Identify all co-effects, including space reallocations from the existing site, impact on the delivery of academic programs during construction and the possible required relocation as required to implement the plan of existing units.

6. Address campus-wide planning directives as set out in the campus master plan, open space plan, urban design criteria, and site conditions that respond to the broader University community.

7. Identify equipment and moveable furnishings necessary to the project and their estimated cost.

8. Identify all data, networking and communication requirements and their related costs.

9. Identify all security, occupational health and safety and accessibility requirements and their related costs.

10. Identify all costs associated with transition during construction and secondary effects resulting from the realization of this project.

11. Determine a total project cost estimate (TPC) for the capital project including costs of implementation in phases if required, and also identifying all resource costs to the University.

12. Identify all sources of funding for capital and operating costs.

13. Complete report by end of March 8, 2013.

c) Background Information

UTSC Science Building

As the student population continues to expand to meet system demands, UTSC requires additional facilities to accommodate both students and faculty. At present, the campus cannot accommodate additional faculty who require wet lab research facilities. To address this shortage, and to accommodate the expanding research culture and infrastructure needs at UTSC as a result of rapid student growth, a new science building is required.

The most recent science facility, the Science Research Building (SRB), opened in 2008 and was originally part of a much larger infrastructure project. That project had two phases. The current SRB represents Phase 1, which reached its capacity immediately upon opening. Phase 2 was intended to be an addition to the building that continued along the edge of the top of bank. The expansion was not implemented as a result of new planning regulations regarding environmentally sensitive areas. As well the 2011 Campus Master Plan has proposed future development be focused on the North Campus.

With the addition of the Environmental Science and Chemistry Building, UTSC will be able to keep pace with student and faculty requirements for research facilities. More to the point, a sophisticated new science facility will enable UTSC to solidify its growing reputation as a leading hub for scientific scholarship in Canada, and as a destination of choice for aspiring researchers of today and tomorrow. The proposed building will have a number of new research and teaching labs including additional support and instrumentation space associated with the labs that will total almost 3000 nasm.

In addition to new ESC Building, it is anticipated that other facilities will be required to support both student and administrative space needs associated with the on-going growth of the campus. These facilities would include additional classrooms and student spaces, student life/residents centre as well as conference and partnership facilities.

Recent Campus Capital Investments

The opening of the Instructional Centre (IC) in 2011 provided new classroom and teaching spaces designed to meet the needs of two high demand programs (Management and Computer and Mathematical sciences). This facility also provided high-quality secondary spaces for non-wet lab and administrative departments. However, these investments did not provide for expansion of wet lab facilities. This will be the primary role of the new Environmental Science and Chemistry Building. The need is further underscored by the aging infrastructure of the original Science Wing (SW).

The SW has become extremely dated and cannot be easily or efficiently adapted to meet the needs of a contemporary research program. Repurposing the SRB and the addition of the new Environmental Science and Chemistry Building will allow the campus to address these expansion needs. Faculty in less than optimal labs can move into vacated lab spaces in the SRB providing much higher quality facilities. The vacated laboratories in the SW will be repurposed to provide additional capacity for teaching, research and student spaces.

Ongoing Student Growth

Since 2000, UTSC has experienced an unprecedented surge in enrolment that has transformed and expanded the campus to over 11,200 students. UTSC's growth targets would see an additional 1,900 new undergraduate students join the campus over the next four years. UTSC also plans to double the number of graduate students who conduct the majority of their research here. To keep pace with this expansion, an additional 73 FTE new faculty will be hired, of which approximately 30% will require laboratory facilities. U of T is Canada's leading research-intensive university, and potential faculty therefore expect to have access to state-of-the-art research facilities that will allow them to be competitive in their academic pursuits on a truly global scale (See Figures 1 and 2).

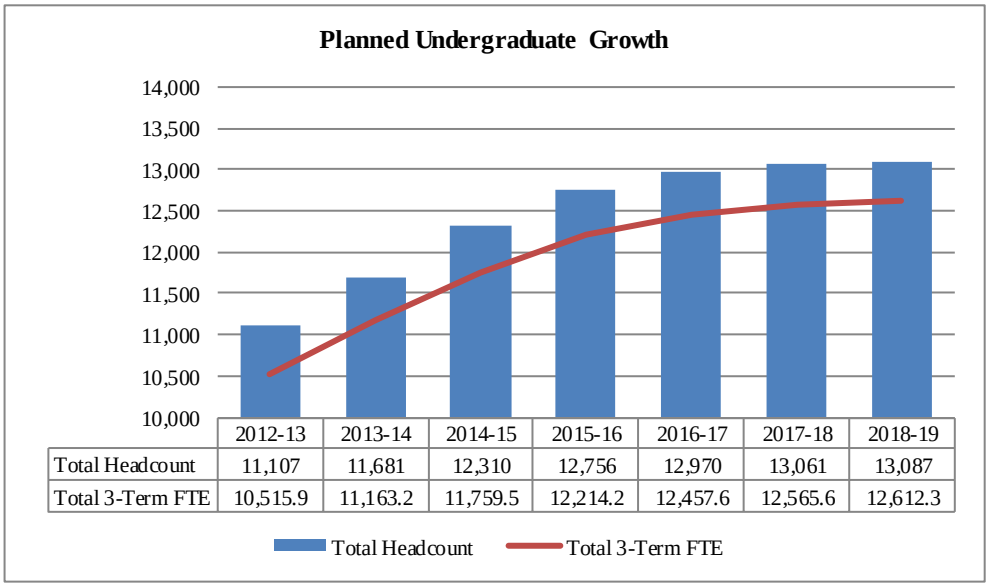
UTSC plans to grow by:

- building on these existing strengths in research and scholarship;
- maintaining its focus on enriching experiential learning opportunities;
- developing highly relevant academic programs at the undergraduate and graduate level.

d) Statement of Academic Plan

Undergraduate Enrolment Growth

UTSC currently has 11,107 headcount undergraduate students, or 10,515 total 3-term FTEs. The plan is for a 20% increase in undergraduate three-term FTE enrolment by 2018-19 over 2012-13 levels to 12,612 FTEs. Projections from the Jan 15, 2013 undergraduate enrolment growth model are summarized below.



	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Total Headcount	11,107	11,681	12,310	12,756	12,970	13,061	13,087
Total 3-Term FTE	10,515.9	11,163.2	11,759.5	12,214.2	12,457.6	12,565.6	12,612.3

Figure 1: Planned Undergraduate Enrolment Growth

While the new Environmental Science and Chemistry Building will be predominantly a research-oriented building, it helps UTSC achieve undergraduate enrolment growth asthe space vacated by the Department of Physical and Environmental Sciences on the south campus will then be used to accommodate the space pressures for more classrooms, student common/assembly spaces, offices for faculty and staff, as well as multi-purpose meeting/student programming spaces.

Graduate Student Growth

Resident graduate students at UTSC comprise those students that are registered in UTSC administered graduate programs as well as students that are registered in St. George administered graduate programs who have declared UTSC as their campus of affiliation.

<u>Resident Graduate Students in UTSC Administered Graduate Programs</u>

In 2012-13, there were 97 graduate students or 83 FTEs in UTSC administered graduate programs. By 2018-19, these numbers are planned to grow to 214 students or 202.1 FTEs. This represents a 143% growth in FTE graduate enrolment. Projections from the Jan 15, 2013 graduate enrolment growth model are summarized in Figure 2.

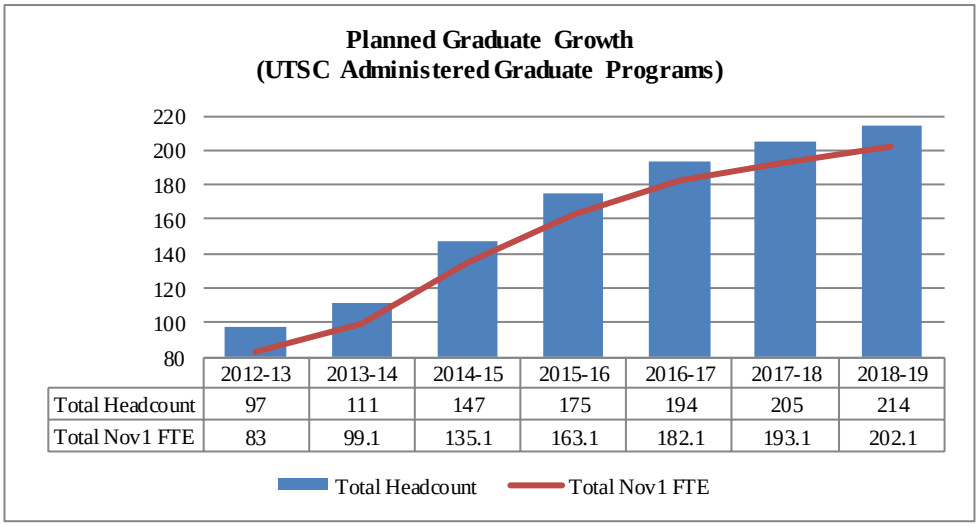


Figure 2. Planned Overall Graduate Enrolment Growth

The majority of the growth in UTSC administered programs is within the Department of Physical and Environment Sciences, which represents all of the 2012-13 graduate enrolments and 65% of the 2018-19 enrolments.

Further increases in graduate enrolment for UTSC administered programs is planned as more funded graduate spots become available.

Resident Graduate Students in St. George Administered Graduate Programs That are Affiliated to UTSC

In 2012-13, there were 118, or 116.6 FTE UTSC affiliated students from St. George administered graduate programs. Growth is also planned for these graduate students and the number is expected to increase by 80% by 2018-19 to approximately 212 students or 210 FTEs.

On an overall basis, the resident graduate student complement, currently at 215 students, is expected to increase to 426 students by 2018-19, representing almost 100% growth over 2012-13. The new Environmental Science and Chemistry Building will help to address the space needs of the resident graduate students by providing graduate student office space as well as research space for doctoral stream graduate students.

Non-Resident UTSC Graduate Students

There are currently about 350 non-resident UTSC graduate students that are not included in the sections above. While these students are supervised by UTSC faculty, their campus affiliation is not UTSC so there is no UTSC space impact for this group of graduate students.

DPES

The Department of Physical and Environmental Sciences (DPES) evolved from the former Division of Physical Sciences and is currently embarking on an exciting and progressive period of scientific growth. DPES is both a multi-disciplinary (Chemistry, Environmental Science, Physics and Astrophysics) and an interdisciplinary department. Each of the three groups is a standalone discipline with an identity, cultural ethos and educational canon of its

own. The Environmental Science group has matured into a vibrant community of internationally recognized researchers and scholars consisting of geologists, physical geographers, geochemists, microbial biologists, and climatologists. The Chemistry group has seen an unprecedented growth in research faculty and superlative teaching stream hires and focuses on environmental chemistry and biological chemistry. The Physics and Astrophysics group is going through a renaissance and have developed a bold set of new UTSC based programs with an aggressive complement plan to provide a powerful group in Planetary Physics. DPES is host to a number of undergraduate programs in all disciplines with a total enrollment exceeding 4000 FCE. Chemistry has the largest enrollment in its programs.

DPES is a UTSC-based research powerhouse and has excelled in research in the fields of chemistry, physics, and astronomy for a very long time. There are considerable research synergies within DPES, especially seen in the research integration between the Chemists and Environment Scientists. This was achieved by a hiring strategy that allowed for significant common ground for chemistry and the environmental scientists already present at DPES at the beginning and more recently for the growth of biological chemistry. As a highly research intensive department, DPES has long been host to resident graduate students from tri-campus graduate programs and now has the largest group of graduate students on campus, including a very successful professional Masters and now a Ph.D. program – the first tri-campus Ph.D. program fully housed at UTSC.

The new Environmental Science and Chemistry Building will be the new home to two of the three disciplines – Chemistry and Environmental Science and will serve as the hub for research and teaching in these two disciplines. The building will support teaching and research of DPES faculty and will enable strong interactions of researchers and students at all levels that is representative of the University of Toronto's strong research culture. The new building will be the home for undergraduate students in Chemistry and Environmental Science and allow them to pursue an undergraduate degree at Canada's most research-intensive university, interact with world-class research-active faculty, having access to undergraduate research opportunities on campus, being taught by teaching assistants that themselves are actively engaged in research as graduate students, benefitting from the seminars and colloquia given by members of, and visitors to, the university, and - last but not least - benefitting from having studied at, and graduated from, a university/campus known for research excellence.

A significant function of the new Environmental Science and Chemistry Building will be to provide space for our Professional Master of Environmental Science students. Growing from an initial intake of 16 students in January of 2006, the program now admits approximately 60 new students each September. Full time students graduate in twelve months, but a number are part time, so in recent years we have had an annual cohort of 70-75 students who require study, seminar and computer terminal space for their work and interactions. Until early 2013 these student were housed in a dated physics laboratory, but currently have moved to a 108 nasm refit in a portable that is slated for removal in 2015 at the latest. The inadequate space that we have for this group has kept a cap on planned or requested growth. There is high potential to increase our intake into this successful program if we can provide highly quality infrastructure. Indeed, a proposal to include a program stream focused on Climate Change

adaptation is soon to be approved, and we anticipate bringing in an additional 10-16 students per year in this stream alone. Similarly, discussions on the inclusion of a program stream dedicated to Conservation Biology will lead to further growth when plans solidify.

Our new PhD program in Environmental Science began admitting students in 2010, and now has 26 students with a target intake of 10 more this September. The Environmental Science and Chemistry Building will give consolidated space to our research graduate students as they are currently located in three different buildings. As this is the first tri-campus PhD program that has its administrative base and the bulk of its students on the UTSC campus, we are excited to be at the design phase of a science building that will provide them with good research, seminar, interaction and writing space, in close proximity to the research faculty administrative staff who help them through the program.

e) Space Requirements

Existing Space

The existing space by building and discipline for DPES is as follows:

Table 1 Existing DPES Space (Nasm) by Building and Discipline

	H-Wing	Portable 103	Portable 104	SRB	S-Wing	Total Nasm
DPES	-	11	21	300	263	595
Chemistry	-	63	-	262	1,824	2,149
Envir Sciences	38	126	-	452	918	1,534
Physics	-	-	-	-	601	601
Total Nasms	38	200	21	1,013	3,606	4,879

The existing space by space category and discipline for DPES is as follows:

Table 2 Existing DPES Space by Category of Space and Discipline

	DPES	Chemistry	Env Sciences	Physics	Total Nasm
Faculty Offices	44	218	271	82	614
Staff/Tech Offices	139	28			168
Student/DSA Offices	70	160	223	61	515
Research Labs	196	451	764		1,411
Teaching Labs		1,288	264	457	2,010
Dept Support Space	145	4	12		161
Total Nasms	595	2,149	1,534	601	4,879

The science building will house the DPES disciplines of Chemistry and Environmental Sciences as well as some non-academic department spaces. The DPES space program includes the current space requirements for these two disciplines as well as space for proposed growth in faculty complement and student enrolments. Below is the space profile for the entire department although only Column J Total will be accommodated in the building:

Table 3 DPES Profile

ES Profile 2012-13 and With Growth

	DPES TOTAL			Chemistry			Env Sci		Physics	
	2012-13	With Growth	In New Sci Bldg With Growth (excl Some Chem & All Phy)	2012-13	With Growth	With Growth Excl Some Chem That Will Remain	2012-13	With Growth	2012-13	With Growth
	H=A+D+F	I=B+E+G	J=C+E	A	B	C	D	E	F	G
FTE faculty - tenure stream	22.5	24.0	18.0	9.0	10.0	8.0	9.5	10.0	4.0	4.0
FTE faculty - teaching stream	10.5	11.5	7.8	5.0	5.0	5.0	1.8	2.8	3.8	3.8
Total FTE Faculty	33.0	35.5	25.8	14.0	15.0	13.0	11.3	12.8	7.8	7.8
FTE PMAS Env Sci	51.9	75.1	75.1				51.9	75.1		
FTE Tri-campus MSc & PHD	80.0	114.0	89.0	32.0	46.0	30.0	45.0	59.0	3.0	9.0
FTE PDF	17.0	19.0	18.0	7.0	7.0	7.0	9.0	11.0	1.0	1.0
FTE Res Assoc	1.0	1.0	1.0	1.0	1.0	1.0	-	-	-	-
Total Research Team	98.0	134.0	124.0	40.0	54.0	38.0	54.0	70.0	4.0	10.0
#FTE PMAS Per FTE Fac (Ten)							5.5	7.5		
#FTE Tri-Campus MSc & PHD per FTE Fac (Ten)	3.6	4.7	4.9	3.6	4.6	3.8	4.7	5.9	0.8	2.3
#FTE Research Team per FTE Fac (Ten)	4.4	5.6	6.9	4.4	5.4	4.8	5.7	7.0	1.0	2.5
FTE Non-Acad Staff (need offices)	8.0	9.0	9.0							
FTE Techs (need offices)	10.0	10.0	10.0							
FTE Non-Acad Staff restricted funds	-	-	-							
Student Contact Hours in lab based courses	4,364.0	5,235.4	4,272.7	3,054.5	3,664.4	3,664.4	507	608.2	802.5	962.7

UTSC recently made substantial investments in renovation to several Chemistry facilities leading to a decisions to retain those facilities those researchers, their research teams, as well as one of the chemistry teaching labs. These functions will not relocate to the new building. Also, due to budgetary limitations, the discipline of Physics will not be relocated but will instead remain on the south campus, where its allocated space is to be renovated to improve functionality and efficiency

Space Analysis

The Committee used the COU methodology as a benchmark for determining the space requirements for the future occupants of the Environmental Science and Chemistry Building. However, it was determined that the research space allocation should be adjusted, essentially lowered for Chemistry and Physics but increased for wet labs in Environmental Science, as UTSC has been able to use research space very efficiently but also recognizes the need for wet labs for some research activities within the discipline of Environmental Science. The following space factors were used for the COU analyses:

- Wet lab researchers in Chemistry: 37 nasm (vs 45 per nasm per COU)
- Wet lab researchers in Environmental Sciences: 30 nasm (vs 10 nasm per COU)
- Dry lab researchers in Environmental Sciences: 10 nasm (as per COU)
- Researchers in Physics: 5 nasm (vs 45 per nasm per COU)

This methodology to generate COU research space has been adjusted in the table below and all COU tables following.

Table 4 compares the existing space to the space generated for current academic and staff complements and for growth including professional master's students, and doctoral stream graduate students

Table 4
COU Generated Space for DPES Current and Planned Complement

	DPES Current Nasm	Generated Nasm 2012/13	Generated Nasm With Growth	% Growth of Existing Nasm
Teaching Labs	2010	2618	3141	64%
Research Labs	1411	1840	2394	59%
Faculty Offices	614	610	661	93%
Student Offices	515	528	756	68%
Dept Staff/Tech Offices	168	169	182	92%
Dept Support Space	161	327	400	40%
DPES Total	4879	6092	7534	65%

However, as mentioned previously, not all of the Department will relocate to the new building. The table below restates the COU methodology to generate space, excluding those areas that will not relocate. The resulting generated space is compared against the proposed space program for the new building.

Table 5
COU Generated Nasm with Growth for Relocated Groups Only

	Generated Nasm	Proposed ESC Space Program	
Teaching Labs	2564	1052	+ 500 nasm remaining in South Building
Research Labs	1837	1839	
Faculty Offices	522	530	
Student Offices	656	564	
Dept Staff/Tech Offices	182	178	
Dept Support Space	340	283	
DPES Total	6101	4446	

The variance between the space generated using the space standards and the proposed new building space is primarily in teaching labs. With intense teaching lab utilization in the sciences, similar to the model used in Arts and Sciences at the St. George campus, as well as better utilization of teaching lab facilities in the summer session, UTSC will be able to accommodate the increased demand for lab based courses within the current allocation of teaching lab spaces. As well, the generated nasm in the table above include all of Chemistry undergraduate teaching activity whereas the space program excludes approximately 500 nasm of undergraduate Chemistry teaching lab space that will remain on the south campus. This decreases the overall variance for teaching labs.

An important impact of this project is the space that approximately 3,350 nasm will be vacated and made available for reallocation on the south campus. Details are provided in the Co-effects section.

Staging and swing space requirements are not anticipated as occupants will vacate existing facilities and move directly to the new building.

UTSC Campus - Space Summary

Table 8 shows UTSC's current space compared to the COU (Council of Ontario Universities) standard and comparable data estimated for 2015-16, when the Environmental Science and Chemistry Building will be completed. In this table, the COU Index represents actual space divided by COU generated space, which is generated based on COU guidelines for space standards given the level of students, staff, and faculty on the URSC campus. The 2012-13 data show that UTSC is at 75% of the space generated by COU standards for overall campus space. By 2015-16, this index is estimated to drop to 70% even though there will be the addition of 5,058 nasm in the ESC Building to the campus space inventory. The space generated by UTSC's enrolment and complement is increasing at a greater rate than the space that will be constructed. Without the new Environmental Science and Chemistry Building, the overall index would be even lower by 2015-16, at 64%.

Table 6
Comparison of UTSC Nasm to COU With and Without the ESC

	2012-13		**Planned 2015-16**	
	Existing Nasm	% Existing of Generated Nasm Per Space Standards	Existing Nasm with the ESC Bldg	% Existing of Generated Nasm Per Space Standards
Classrooms	7,300	63%	7,421	55%
Teaching Labs	4,828	91%	4,876	80%
Research Labs	6,684	75%	7,506	65%
Academic Dept Space	9,805	103%	10,113	92%
Central Admin Space	4,912	90%	4,936	75%
Library and Study Space	5,928	65%	5,968	58%
*Low Intensity Vacated Space**	-	-	3,247	
Subtotal, Academic & Support Space	39,458	79%	44,068	75%
Recreation & Athletics	4,398	52%	4,398	45%
Student & Central Services	11,092	73%	11,540	66%
Subtotal, Other Space	15,491	66%	15,938	58%
UTSC Total Assignable Space	**54,948**	**75%**	**60,006**	**70%**

** DPES vacated space to be reassigned for low intensity use.*

III. Project Description

a) Vision Statement

The new Environmental Science and Chemistry Building at UTSC will become the scientific anchor for the North Campus development. The facility will house the UTSC premiere Environmental Sciences department and Chemistry department and will become a conduit for research and discovery across these disciplines.

The Environmental Science and Chemistry Building will continue the expansion and animation of Military Trail as contemplated in UTSC's 2011 Campus Master Plan. Situated adjacent to the recently completed Instructional Centre, the building will continue development of the Military Trail streetscape towards the new Toronto Pan-Am Sports Centre at the street's terminus.

The Environmental Science and Chemistry Building will provide state of the art facilities that enable the discovery of new knowledge and provide an outstanding platform for the next generation of undergraduate and graduate students in a world class teaching and research environment. The building will feature sustainable technologies that meet and/or exceed requirements for LEED Silver designation. At the same time, the facility will provide exemplary modern research and teaching laboratories. Reference peer buildings for laboratory layouts include the Science Research Building (SRB) at UTSC, Lash Miller Building at U of T St. George, the CCBR at U of T St.George, MaRS Centre (University Health Network, the Hospital for Sick Children and Ontario Institute for Cancer Research Labs) and the University of Oxford Chemistry Research Laboratory.

The building is expected to be organized along a central space, running parallel to Military Trail, thus extending the connection pattern laid out in the Instructional Centre. Opportunities for interaction and sharing of knowledge should be capitalized upon through the design of this space and the building as a whole. Ample daylighting and glazing should be incorporated into the building design, especially at the ground level facing Military Trail. A total of 10,116 gross square metres will be constructed.

b) Space Program and Functional Plan

Space Program:

	NASM / Room	# of Rooms	Total NASM
DPES Space			
Administrative Suite			
Chair Office	18	1	18
Graduate Chair Office	16	1	16
Business Officer Office	16	1	16
Assistant to Chair	12	1	12
Graduate Program Staff	12	3	36
Shared open space for staff workstations - 4 stations	20	1	20
Small Meeting Room, 8 seats	16	1	16

	NASM / Room	# of Rooms	Total NASM
Reception	20	1	20
Secure Exam Storage Room	12	1	12
Office Storage Room	20	1	20
Mail / Photocopy Room / Area	20	1	20
TA/Graduate Student Mail Slots	5	1	5
Subtotal			**211**
Academic Offices			
Faculty Office	12	30	360
Stipend/Visitor Office, etc.	25	2	50
Post Doctoral Fellow & RA Office	12	10	120
Subtotal		**42**	**530**
Technician Offices			
Technician Offices (2 per office)	12	5	60
Subtotal		**5**	**60**
Graduate Student Offices			
Local Prog Masters Stu Group Ofc (75.1 FTEs)	150	1	150
Physically present grad stu (3 / ofc for 89 FTEs)	12	30	360
Subtotal		**31**	**510**
Student Society& DSA Offices			
Departmental Stu Assoc office	18	1	18
Student Society Offices (Chem)	12	3	36
Subtotal		**4**	**54**
Teaching Laboratories (based on current space)			
Chemistry U/G Teaching Fumehood Intensive	500	1	500
Chemistry U/G Teaching "D" Level	100	1	100
Chemistry U/G Teaching Instrumentation Room		1	
Chemistry Analytical Balance Room		1	
Chemical Stores	38	1	38
Chemistry U/G Teaching Support & Storage	50	1	50
Chemistry Traces Instrumentation Centre	100	1	100
Environmental Science U/G Teaching Lab	106	2	212
Environmental Science U/G Teaching Support	52	1	52
Subtotal			**1,052**
Research Laboratories			
Wet primary research labs			1,100
Wet research labs support			286
Dry primary research labs			165
Dry research labs support			69
No lab researchers - group lab for graduate students			79
Dedicated research lab storage space			140
Subtotal			**1,839**

Other Departmental Support Space (not in Admin Suite)			
Board Room, 40 seats	100	1	100
Faculty/Staff/Student Lounge (incl kitchen)	48	1	48
Larger Meeting Room, 16 seats	30	1	30
TA / Sessional Meeting Room, up to 6 seats	12	1	12
Subtotal		**4**	**190**
Total DPES			**4,446**
Non-DPES			
Police Office	12	1	12
Police Change Room and Support Space	12	1	12
Catalyst Centre - Multi-purpose space, as follows:			
50 seat seminar room	91	1	91
Smaller 15 seat graduate seminar room	30	1	30
Librarian Office	12	1	12
Study Room	40	1	40
Multi-purpose bookable space	15	1	15
Basement storage			400
Total Non-DPES			**612**
Total			**5,058**

Tentative Functional Plan

Basement
- Storage
- Matthew Wells Lab
- Mechanical Equipment
- TRACES (tbd)

Ground Floor
- Teaching Labs
- Campus Police
- Catalyst Centre
- Study space
- Chem Stores

2nd Floor
- SeniorTeaching Labs
- Administrative Suite
- Student Society & DSA Offices

3-5th Floors
- Faculty Offices
- Grad Student Offices
- Wet Research Labs
- Dry Research Labs

Primary Academic Spaces

Wet Research Laboratory

The research laboratory should be comprised of modules that allow collaboration of research teams, while at the same time allow a single research team to operate independently within. Modules should be designed with flexibility in mind and allow for combination, expansion and contraction as research teams grow and adjust over time. For planning purposes, a research team is assumed to consist of one principal investigator (faculty), and between 1-12 post-doctoral and/or graduate students.

The research laboratory area should be separate from the undergraduate and public areas of the building, ideally on the upper floors with suitable security features in place. They should be close to faculty offices to ensure proper supervision and consultation.

Ideally the labs should be daylit, and the various labs should be separated by glass. Entry should proceed from the hallways into the graduate space, and from the graduate space into the labs. The proximity is critical for monitoring time sensitive experiments, enables GLP, and supervision.

Ideally this is an open concept space with shared instrument rooms and fridge/freezer rooms, and there is a need for space solvent drying towers and gasses (nitrogen lines should be piped in ideally from a centrally located nitrogen blow-off or nitrogen generator).

At least one research laboratory will be located in the basement of the building due to high volume usage of water.

Dry Research Laboratory

The dry research laboratory will primarily incorporate computer-based or instrument-intensive activities and will not be dedicated to a single research team. The lab should be accessible to the other research laboratories configured in a manner that will allow the ready removal, relocation and replacement of furniture, furnishings and equipment. It should be capable of being divided into multiple light-tight compartments.

Ideally this laboratory mirrors a wetlab. This simplifies planning and avoids potential issues with labs that are specific to any particular researcher labs.

Teaching Laboratories

Three main undergraduate teaching laboratories are planned for the new facility: a Fumehood Intensive Chemistry lab, Environmental Science lab and a D-level Chemistry lab. The labs include support and storage spaces. The teaching labs should be located within vicinity of one another and separate from the graduate and research spaces in the building. It is suggested that the teaching facilities be placed on lower floors, with easier access for undergraduate students who will be moving to and from the building for other classes.

Ideally the space should be daylit, and as it is central to our teaching mission, it should be readily accessible, close to student spaces and easily accessible to the TRACES lab.

TRACES Instrumentation Centre

The TRACES Instrumentation Centre will be relocated from its current space in the Science Wing to the Environmental Science and Chemistry Building , and will be used by undergraduate students, graduate students and principal investigators. The facility should

have close access to the loading and service corridor that leads to the loading area in the Instructional Centre. A basement location may not be ideal for TRACES, given its storage of singular cylinders of flammable compressed gases and the presence of the NMR instrument(s) and associated issues with catastrophic quenching of the magnet, resulting in the release of large quantities of gas. It must have support areas for the housing of its standalone mechanical and electrical support infrastructure located nearby where they can be accessed by both local Lab operational staff and Facilities Management Staff. It is also useful for it to be located at the building perimeter as there is substantial process and safety exhaust requirements while at the same time located away from public traffic flow and gathering areas. It will house the TRACES NMR instrument(s) and as such particular care must be taken to plan for suitable space.

Chem-Store

The Chemical Store will be housed on the first floor of the building and will have ready access to the loading dock of the IC building and will be able to house an inventory of chemicals and other consumables for teaching and research, including storage of solvents, gas cylinders, and solid chemicals.

Non-academic department spaces

Non-academic department space in the new building will include office space for Campus Police, a Catalyst Centre, a librarian office, multi-purpose bookable space, study space, and basement storage space.

The new building will be the second new building on the north side of the campus. There is already a significant student and staff presence on the north side and this will increase with each new building. In the interests of safety, it was deemed timely to have a visible, ground floor police presence in the building that will give a sense of safety and security to our north campus community and the community at large.

UTSC's learning model includes a librarian office for each academic department in all new infrastructure. This office should be located with the faculty offices.

Our students are very vocal that study space and multi-use bookable space keep pace with increases in our enrolment, so a guiding principle is that each new building should also include these student spaces.

The Catalyst Centre is envisioned as one larger room with versatile design allowing for subdivision into 2 seminar rooms: one with 50 seat capacity and a smaller, graduate seminar room with 15 seat capacity. These rooms will be part of the centrally booked classroom inventory but will also be used as a venue for visiting lecture series, student seminars, and other research and campus events. The ground floor is the ideal location for the Catalyst Centre.

There is a chronic shortage of storage space on campus so additional basement storage was added to the building to help alleviate this shortage.

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Non-Assignable Spaces:
The non-assignable spaces include corridors, stairwells and mechanical stacks. These aspects of the building program are to be accommodated within the gross to nasm factor of 2.0. The architect will get further details from Facilities Management and other relevant departments at UTSC; room data sheets have been prepared for all spaces. Some specific requirements that have to be met in non-assignable spaces are the following:

- Atrium/Lobby
- FM Storage Room
- Caretaking Store Room
- Crush Space/Circulation Space
- Janitor's Closets

c) Building Considerations

The new building is planned to be five storeys in height, and will include a full basement. It is conceived as a single block with an animated ground floor. Local materials should be used where possible, for both interior and exterior components and spaces. High quality, durable finishes are required to match surrounding landscape and buildings. As such, exterior finishes are to contain a combination of glazing/curtain wall and brick.

Building characteristics and massing
The building is anticipated to be 5 levels above grade and 1 level below. The floor to floor heights should be minimum 4m, but will be discussed in detail during the RFP development.

The main mechanical room is to be located to suit geothermal, earth tubes, structural complexity, building function, and built form. In general, teaching spaces should be located on the lower levels of the building while the upper levels should house departmental administrative offices and faculty offices. Research spaces and graduate student offices should be located in proximity to associated faculty offices.

Material selection
The building will be designed to match surrounding landscape and buildings. As such, exterior finishes to contain a combination of curtain wall and masonry units/panels.

Key building components and systems

Mechanical/ Electrical and Data
The building will require its own central heating and cooling plant as there is no additional capacity in the neighbouring Instructional Centre, and it is remote from the South campus central utilities plant.

This will likely be a hybrid geothermal plant with supplemental low temperature condensing boilers and high efficiency chillers. A geothermal conductivity test was conducted and concluded that this location was ideal for such an installation.

The building should be well zoned for air handling to allow for system scheduling such that research labs, teaching labs, classrooms and administration areas all can be zoned separately. This will allow for the building to function in the most energy efficient manner possible, such that the air handling systems can be shut off in unoccupied hours. This concept is particularly beneficial in the laboratories, classrooms/workrooms, and in administration areas where research and experimentation isn't running continuously.

Both the teaching and research laboratories will function as variable air volume systems, implying/requiring automated fume hood face velocity controls. In addition, an air quality monitoring system should be implemented to allow air change rates to be reduced based on identified risk. These systems have become industry standard and have effectively balanced capital cost with reduction in operating costs driven by the elevated ventilation rates in laboratories.

Heat recovery or air treatment of some form is to be implemented and the following options will be considered in a cost benefit analysis.

- Earth Tubes to pre-treat incoming building outdoor air
- Cross flow air to air heat exchanger
- Fluid heat recovery run around loop between building supply air and exhaust air

The power systems in the new building will have an elevated requirement for emergency power driven by the necessity to keep the laboratory building systems running to maintain the health and safety of the occupants of the building and to support the intellectual property of critical research taking place there. There will also be a need for a central uninterruptible power supply to sections of the electrical distribution system serving the state of the art research measurement and instrumentation equipment as well as stored research data.

One of the key process gases for laboratories is compressed air which is critical to key for instrumentation labs as point of use in the laboratories at benches and fume hoods. Compressed air on emergency power will be required for the TRACES Centre and possibly other areas as the design develops.

Also a central lab vacuum system should be planned and cylinder based gases will be required as they will be heavily used in the facility. Some of the specialized gases are Hydrogen, Nitrogen (possibly via a nitrogen generator), Helium, Acetylene, Argon amongst others. Reviewing the gases will be key element in code study for the facility.

The building lighting system is to have a 120V lighting distribution and LED fixtures throughout. Exterior lighting should consist of 600V distribution and LED fixtures throughout. All panels should be isolate-able without affecting other areas of the building for regular maintenance, service and ongoing equipment addition in the labs as the research activities change with time.

The main building IT service will be extended from the newly constructed data centre in the neighbouring Instructional Centre. Similarly, telecommunications services will originate from the IC. A VOIP telephone system will be utilized.

Accessibility

The building will be accessible throughout and meet all University standards. Fully accessible washrooms will be provided throughout. Entrances will be designed for universal access rather than employing specialized ramps.
At least one of the elevators must be large enough to accommodate scooters.

Personal safety and security

Personal safety must be taken into consideration in the design of the building.

The building will connect to the security system backbone which will run to security closets on each floor. From here, security connections will be extended to high security areas, in particular the laboratories and the departmental offices and suites. Included as part of the central security system, will be the installation of a public address system that will be connected to the campus public address system (currently in process of installation) and Campus Police. CCTV cameras will monitor entry points to the building, laboratories, and other security demanding areas as identified.

Card access is to be provided for all perimeter exterior doors, laboratories, office areas, and elevator(s), and staircases.

The building will be sprinklered and have a standpipe system to meet the building code for its industrial occupancy.

Pre-action or chemical based sprinkler systems should be considered for areas of high capital equipment investment such as the TRACES Lab protecting them from the risk of water damage.

Servicing (including garbage and recycling, deliveries)

Each floor of the building will contain at least one janitor's closet. The closet on the ground floor must be a minimum of 2.5m wide by 6m long, (to permit storage of maids carts, floor scrubber machine and vacuums), and include a slop sink, one dedicated electrical outlet for recharging equipment, and storage shelves. The other closets may be sized at a minimum of 1.5m x 3m and include a slop sink, storage shelves, and an electrical outlet.

An underground tunnel will be constructed to connect with the Instructional Centre where a knock out panel currently exists on the west side.

Servicing/Deliveries will be via the existing loading dock at the adjacent Instructional center. A below grade pedestrian tunnel, constructed as part of the proposed building, will link with the Instructional Centre. This tunnel will be used to transport deliveries to the proposed building.

Elevators

There are to be two elevators planned for the building. The elevators are to be machine rooms less type elevator sized practically to meet the loading and occupancy.
Service should be thoughtfully planned such that deliveries of chemicals, gases etc. can make it safely into the building away from the general public with seamless access to the Instructional Centre loading dock.

Acoustics

The acoustic performance requirements of the facility will be identified in the RFP for the construction team to provide and/or build to. An acoustic consultant should be part of the construction team to ensure that it is executed/delivered. This will include NC levels for background sound, STC levels for sound isolation and transmission and reverberation time index (RTI) for speech intelligibility. Further, vibration control will also be identified to eliminate vibration transmission from building utility equipment and services to the occupied areas ensuring comfort, health and safety and reliable research functions.

Any facility built in Ontario must ensure that all applicable environmental noise limits and guidelines are met. The construction team must prepare and submit an Acoustic Assessment Report in accordance with the requirements of the MOE and the application for a Certificate Of Approval. This will be incorporated in the RFP and then be part of the construction execution process by the successful bidder.

The design should ensure that any noise emissions from the Facility impacting nearby receptors falls within the acceptable sound level limits defined by the Ministry of Environment (MOE) in publications NPC-205 or NPC-232.

Noise mitigation designs should also be considered for off-property points of reception which are not defined as such in MOE Publication NPC-205/232. These courtesy receptors may be locations such as neighbouring buildings such as Centennial in our case. It is preferred if an effort is made to prevent the noise impact of the site to these points to be above a reasonably expected noise environment.

Signage and donor recognition

All signage to abide by UTSC Signage and Graphics Standard dated September 28,2011. The ground floor should accommodate the display of public art, material relating to faculty and student work in public areas. At minimum, the space should be able to accommodate the length and width of glass vitrine cases. The exact sizing will be determined during the design phase.

Computing

This building will be fully connected to the campus fibre network from the neighboring Instructional Centre.

Detailed data drop requirements have been identified in the room data sheets and may require further development during design.

In consultation with IITS, appropriate locations for wireless transmitters will be identified and transmitters installed to provide the widest possible coverage.

Redundancy should be allowed in the size of the conduits to permit for additional future cabling.

Sustainability Design and Energy Conservation

The Environmental Science and Chemistry Building should be designed to meet a minimum LEED Silver Standard, as well as meet the Toronto Green Building Standard with a desire for Voluntary Tier 2. It will be environmentally sound in many different ways, including the use of recycled construction materials, locally manufactured materials, energy efficient LED lighting and advanced lighting control, thoughtful heating and cooling system design, passive design to reduce heat gain, operable windows where appropriate, sustainable high albedo roof, low flow plumbing fixtures, materials from sustainable sources, low VOC paints and carpets, the use of storm water for irrigation, and attention paid to the minimization of non-recyclable waste during construction.

The building design team will be asked to pay particular attention to:

- Reduction in energy/utility costs which are of particular concern in laboratories driven by their elevated ventilation rates. This would be accomplished in part but not exclusively through the strategies discussed in in the Building Considerations section.
- Strategies to maximize the use of natural energy or passive strategies such as the use and control of sunlight both to reduce electrical lighting levels and conversely promote reductions in solar heat gain, promote ventilating air movement, and both capitalize and minimize the effects of diurnal and seasonal temperatures..
- Water conservation through the use of water saving fixtures and closed-loop cooling systems for the process cooling requirements in the labs.
- Metering of energy and water use in the building, or parts of it for benchmarking, energy management and optimized operation.
- Building materials (e.g. drywall) , finishes (e.g. paint), furnishings (e.g. carpets), fixtures (e.g. lighting) and furniture which are not only emission-free (to provide building occupants with highest quality of indoor environment) but are also the most environmentally friendly in their manufacture and installation.
- Conveniently and sufficiently locating waste receptacles to minimize litter buildup.
- Using water penetrable systems in outdoor areas where hard landscaping is required to minimize flows to the City's storm water system (or into the building), and choosing paving materials to assist the University in minimizing the amount of salt used in snow and ice clearance.
- The landscape design to promote local plant species that require low maintenance.
- The design of outdoor spaces for all-season use, with shade and cool air movement for the summer, and sun-trapping and wind shelter for winter use, and sensitive accommodation of smokers away from the building entrances to reduce potential harm from second hand smoke.

It is recognized that all of the above strategies may not be practical to implement. However, the design build team and the building's users must make an earnest effort to ensure that this building, when viewed in its entirety, will satisfy the environmental goals set out by the University.

The University's design team will be looking at energy/utilities consumption metrics to be met by the proponents in the design build process. These would be arrived at through the analysis of the U of T portfolio of buildings and other published metrics. Also application to the City of Toronto's Better Building Partnerships will be considered to assist with energy modeling for selection of design alternatives and to investigate financial incentives for innovative elements of the design.

d) Site Considerations

Campus planning issues

Zoning

The UTSC campus is part of the Highland Creek Community Secondary Plan. The site for the Environmental Science and Chemistry Building is zoned Institutional, with a permitted building height of five storeys. An "H", or holding, zone designation has been applied to the site. This designation was put in place to address environmental concerns due to its proximity to a closed City of Toronto municipal waste site which has recently been remediated, as well as typical planning issues such as traffic studies and servicing reports. During the planning process for the Instructional Centre, this designation was successfully lifted for the immediately adjacent IC site. It is expected that the same result will be achieved for this project. The University and the City of Toronto are currently engaged in a process that satisfies the requirements to lift the "H" designation for the environmental concern, using some of the same material prepared for the Instructional Centre rezoning. The remainder of the review is in progress and requires studies for transportation, planning and stormwater servicing.

The City's review municipal process typically takes between 6 and 9 months. University of Toronto Scarborough is currently working with the City's planning staff to allow for construction of the facility to begin on a sequential permitting basis in a time frame earlier than what would normally occur.

The University of Toronto Scarborough has initiated the selection of consultant teams and is committed to prepare the applications necessary for construction permits for excavation and foundations for City planners to process to maintain the aggressive schedule necessary.

Site boundaries, conditions and constraints

The site is located in what is currently Parking Lot G, immediately adjacent to the recently completed Instructional Centre, northwest of the Ellesmere and Military Trail intersection. As the second building on the north campus lands, the Environmental Science and Chemistry Building will continue the pedestrian-scaled development along Military Trail. In the new campus master plan, Military Trail will become the urban focus of the emerging north

campus. The building should be designed to complement this, with its principal entrances and an urban façade along Military Trail. The building should be aligned with the Instructional Centre to the southeast, and continue sidewalk condition that will become a comfortable pedestrian environment along Military Trail, with grade-level design and uses that complement it.

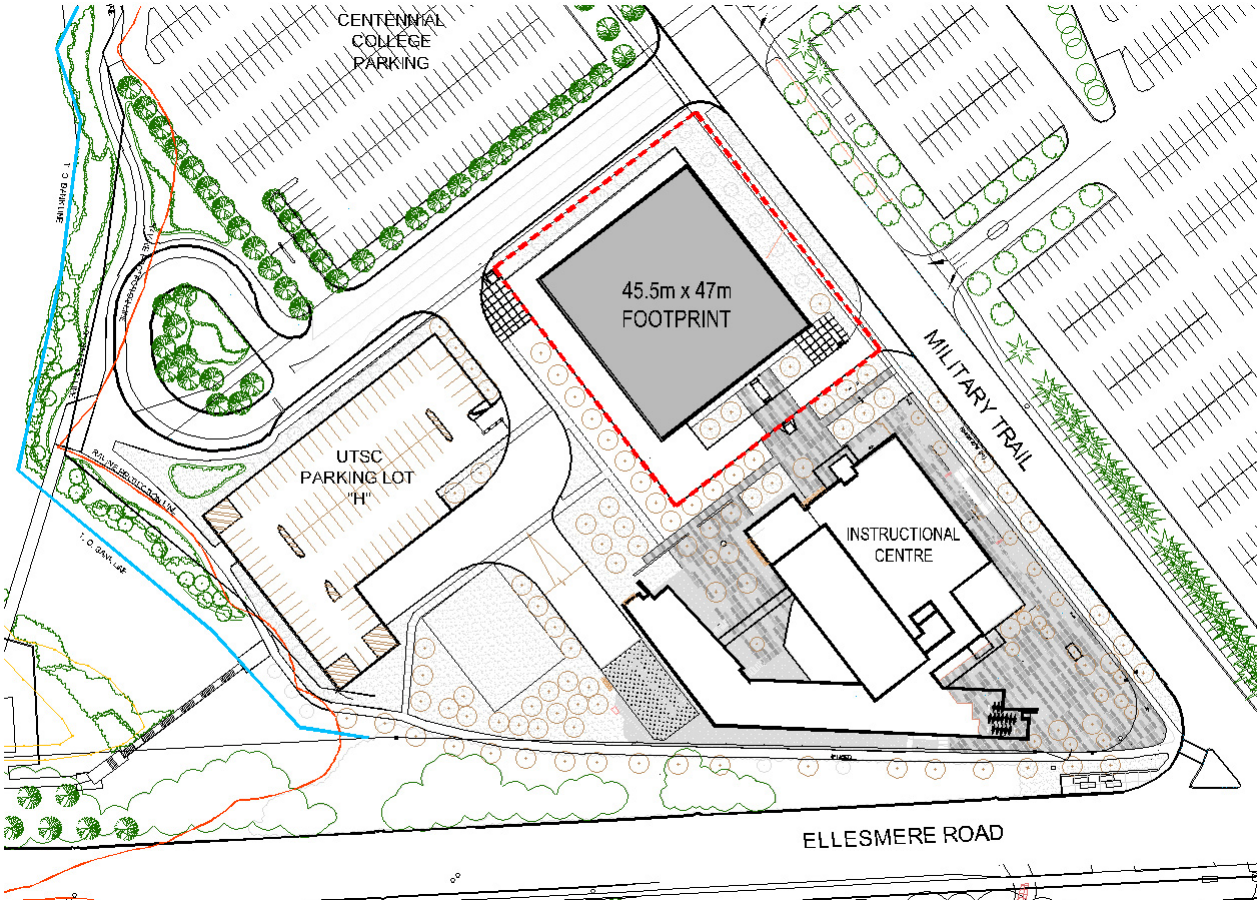

Figure 3. Location and site boundaries of the Environmental Science and Chemistry Building

Relationship of new construction to adjacent buildings, structures, open spaces
The massing of the new building is illustrated in the above diagram. Parking Lot H will remain in use, with no change in access for Instructional Centre servicing.

Landscape and open space requirements
Landscaping will continue the streetscape pattern initiated with the Instructional Centre.

Site access
The site is situated beside the Instructional Centre, thus one building to the northwest of the Military Trail and Ellesmere Road intersection. This intersection is often busy, with university-created pedestrian and vehicular movement, and non-local city traffic along the Ellesmere thoroughfare. The main UTSC parking lots are located directly across from the site on the eastern side of Military Trail.

Ellesmere Road quickly drops in elevation to the west, down the ravine edge to Morningside Avenue. Vehicular access to the site is therefore best served from Military Trail. It is expected that access will be facilitated from the existing entrance that leads to the Centennial drop-off.

Pedestrian traffic will originate from the south campus, the main parking lots, and from Centennial College. Pedestrian traffic is expected to cross at the main Military/Ellesmere intersection, although pedestrian crossings along Military Trail may be necessary in the future to provide multiple direct routes from the parking lots. The physical quality of these crossings should be reviewed and designed or redesigned to provide maximum pedestrian comfort, safety and clarity.

Wayfinding

Interior signage and wayfinding to abide by the University of Toronto Scarborough Signage Standard. Exterior wayfinding should match what exists on the South Campus.

Soil conditions

Soil conditions are to be identical to the neighboring Instructional Centre site, which consisted mainly of sand fill.

Demolition of existing structures

No existing structures exist on the site. It is undisturbed, for the most part, although there may be the remains of one or two foundations/basement walls from old residences that used to be on the site. Drawings and specifications for this project will include for their removal if encountered.

Site servicing: existing

Existing site servicing currently only consists of stormwater piping + electrical services (LV electrical + communications) for parking gates. These will have to be relocated prior to construction as these services need to be maintained during construction. Underground telecommunications and electrical supply for Code Blue emergency phones on the North Parking lots must be relocated prior to construction.

Environmental issues, regional conservation, Ministry of the Environment

The site will require input from TRCA in the Site Plan Approval process to confirm setback from “top of bank”. Stormwater management and runoff will also be reviewed as part of the Site Plan Application.

Hazardous waste disposal

Studies have indicated that no hazardous waste exists on this site, nor is there evidence of methane migration.

e) Campus Infrastructure Considerations

Utilities (electrical, water, gas, steam lines)
Similar to the Instructional Centre, the main electrical service will come from the Military Trail Toronto Hydro Electrical distribution pathway. It will be buried under Military Trail in a duct bank

Similarly, the natural gas will be picked up from Military Trail. Also from Military Trail will be the water/fire service and the sanitary service.

All services from Military Trail should be grouped together to minimize disruption on the roadway even possibly allowing for continuous access to the outer parking lots.

Sewer and storm water management
Storm water will be collected within the site boundary and managed by the Stormtech system installed as part of the Instructional Centre building project. A Site Servicing Report prepared by an external consultant has confirmed that the existing storm water retention system is sufficiently sized to accommodate the new facility.

Communications (phone/data)
Data Communications service is to be extended from the Data Centre in the neighboring Instructional Centre and wireless service is to be provided in the facility.

Telephone service will be provided via the existing Telecommunication feed in the neighboring Instructional Centre. It is intended that a VOIP-based telephone system be provided.

Roads and pedestrian pathways
Since the proposed location for the building is currently a parking lot, there is no intention to create additional roadways to the building. An existing Fire Route can be maintained for the purpose of meeting fire access requirements as well as to possibly create a drop-off circle around the building.

Pedestrian pathways will link the proposed building with adjacent parking lot H and the Instructional Centre.

Bicycle parking
Bicycle parking is currently available at the Instructional Centre. Additional bicycle parking will be provided as required by the City of Toronto's Green Standard.

Servicing and fire access
Servicing/Deliveries will be via the existing loading dock at the adjacent Instructional Centre. A below grade pedestrian tunnel, constructed as part of the proposed building, will link with the Instructional Centre. This tunnel will be used to transport deliveries to the proposed building and infrastructure as required.

Fire access will be via an existing fire access driveway which will run along the East and South perimeter of the building.

Impact on other projects in sector
There are no impacts on other projects in this sector.

f) Co-Effects

Parking
Parking inventory will be reduced with the construction of the new building. Not only will 88 existing spots be lost in Lot G, but the proposed construction will generate an additional requirement of approximately 196 spots. This will eliminate the current surplus and put the university in a slight deficit position. But since demand is not as great as supply, relief from the current by-law will be sought. Traffic studies have recently completed and their findings will be presented to the City as part of the amendment to zoning process.

Vacated Space
UTSC has recently grown from 9 academic departments to 15. This has generated considerable space pressures that DPES vacated space (see Table 9) will help to alleviate.

Table 7.Total DPES Vacated Space

	H Wing	Portable 103	Portable 104	SRB	S Wing	Total
Faculty Offices		11	11	62	395	479
Staff & Technician Offices					168	168
Teaching Labs					1,100	1,100
Research Labs	38			403	576	1,017
Student Offices		168		144	111	423
Department Support Space			11	55	92	158
Total DPES Vacated Space	38	179	22	664	2,442	3,345

Excluded from the table are 44 nasm of vacated space that has been allocated to Physics to provide the discipline with storage space, a mailroom, and room for faculty and graduate student growth.

The Environmental Science and Chemistry Building will aid in alleviating some space needs of the campus. As an interim measure, UTSC installed 5 modular buildings in 2009. These were intended to accommodate some of our space challenges until new facilities were created. In addition to the vacated spaces associated with the new building, there will be vacated spaces associated with the new Toronto Pan Am Sports Centre. These spaces will allow us to repurpose the other parts of the campus, including relocation of functions housed in the portables, and to help with overall space challenges.

A space planning committee has been formed to look at reallocation and renovation of the space that will be vacated by DPES, as well as other space vacancies as they become available. This committee serves as a governing body to review and oversee the space allocation and renovation needs on campus. The priority for this group will be to address the critical space shortages that exist on campus.

g) Schedule

Governing Council approval	May 2013
Design and Construction	June 2013 – June 2015
Commissioning and Moving	July 2015
Occupancy	July 2015

IV. Recommendations

Be It Recommended to the Academic Board:

1. THAT the Report of the Project Planning Committee for the University of Toronto Scarborough Environmental Science and Chemistry Building, dated March 29, 2013, be approved in principle; and

2. THAT the project scope totaling 5,058 nasm (10,116 gross square meters), to be funded by UTSC Operating Funds, Graduate Expansion Funds and Borrowing, be approved in principle.

APPENDICES:

1. Equipment/Furnishings schedules (on request).
2. Room Specification Sheets (on request).
3. Total Project Cost Estimate (on request to limited distribution).