

March 9, 2016

The Honorable Michael R. Pence  
Governor of the State of Indiana  
Statehouse  
200 West Washington Street  
Indianapolis, IN 46204

Dear Governor Pence:

At its meeting on February 26, 2016, the Purdue University Board of Trustees approved the planning, financing and construction of the "Controlled Environment Phenotyping Facility" project on the Purdue University West Lafayette campus.

This project will construct a world-class, controlled-environment plant imaging facility that will complement the University's strong presence in phenotypic analysis of field traits. This proposed facility is part of the Purdue Moves World-Changing Research initiative to expand plant sciences research and education in the College of Agriculture.

The facility will accommodate two large growth chambers with conveyances to a series of automated imaging stations. This project will be constructed on the current site of the Life Science Range #2 Greenhouse, which is scheduled for demolition as part of this project.

The estimated cost of this project is \$6,250,000, to be paid for with University Funds.

Subject to review by the Commission for Higher Education and recommendation by the State Budget Committee and the Budget Agency, we request your approval to proceed with this project. Attached are the completed forms which the Commission has prescribed for its review of such projects. We will be happy to answer any questions you or your staff may have or to provide additional information as appropriate.

Sincerely,



William E. Sullivan  
Treasurer and Chief Financial Officer

/bjm

Attachments

- c: Matt Hawkins, Associate Commissioner and Chief Financial Officer
- Brian Bailey, State Budget Director
- Anthony Hahn, Director, State Relations & Policy Analysis, Purdue University
- Kendra Cooks, Comptroller, Purdue University

**PROJECT SUMMARY AND DESCRIPTION  
FOR: CONTROLLED ENVIRONMENT PHENOTYPING FACILITY**

<b>Institution:</b>	Purdue University	<b>Budget Agency Project No.:</b>	B-1-16-1-07
<b>Campus:</b>	West Lafayette	<b>Institutional Priority:</b>	N/A
<b>Previously approved by General Assembly:</b>	No	<b>Previously recommended by CHE:</b>	No
<b>Part of the Institution's Long-term Capital Plan:</b>	Yes		

**Project Summary Description:**  
 This project will construct a world-class controlled-environment plant imaging facility that will complement the University's strong presence in phenotypic analysis of field traits. This proposed facility is part of the Purdue Moves World-Changing Research initiative to expand plant sciences research and education in the College of Agriculture. The facility will accommodate two large growth chambers with conveyances to a series of automated imaging stations, and will be constructed on the current site of the Life Science Range #2 Greenhouse, which is scheduled for demolition as part of this project.

**Summary of the impact on the educational attainment of students at the institution:**  
 Students will have the opportunity to be exposed to new, state-of-the-art imaging and automation equipment in a controlled environment. This enables students to be involved in research projects that enhance their leadership skills, team efforts, and ability to innovate. In addition, students will be able to understand how modern technology has impacted plant industries. The unique skills and experiences will enhance student marketability.

<b>Project Size:</b>	7,296 GSF	4,567 ASF	0.63 ASF/GSF
<b>Net change in overall campus space:</b>	3,326 GSF	787 ASF	

<b>Total cost of the project (1):</b>	\$ 6,250,000	<b>Cost per ASF/GSF:</b>	\$ 856.63 GSF *
			\$ 1,368.51 ASF *
			* includes cost of demolition
<b>Funding Source(s) for project (2):</b>	\$ 6,250,000	University Funds, current balance is \$14.5M	
<b>Estimated annual debt payment (4):</b>	N/A		
<b>Are all funds for the project secured:</b>	Yes		
<b>Estimated annual change in cost of building operations based on the project:</b>	\$ 52,187		
<b>Estimated annual repair and rehabilitation investment (3):</b>	N/A		

(1) Projects should include all costs associated with the project (structure, A&E, infrastructure, consulting, FF&E, etc.)  
 (2) Be consistent in the naming of funds to be used for projects. If bonding, note Bonding Authority Year (1965, 1929, 1927, etc.)  
 (3) Estimate the amount of funding the institution would need to set aside annually to address R&R needs for the project. CHE suggests 1.5% of total construction cost  
 (4) If issuing debt, determine annual payment based on 20 years at 5.75% interest rate  
 - If project is a lease-purchase or lease, adjust accordingly. Note the total cost of the lease in the project cost, and annual payments in project description

**PROJECT DETAILED DESCRIPTION - ADDITIONAL INFORMATION  
FOR: CONTROLLED ENVIRONMENT PHENOTYPING FACILITY**

<b>Institution:</b>	Purdue University	<b>Budget Agency Project No.:</b>	B-1-16-1-07
<b>Campus:</b>	West Lafayette	<b>Institutional Priority:</b>	N/A

**Description of Project**

The proposed facility is part of the Purdue Moves World-Changing Research initiative to expand plant sciences research and education in the College of Agriculture. This project will construct a world-class controlled-environment plant imaging facility that will complement the University's strong presence in phenotypic analysis of field traits. The new controlled environment facility will allow highly-uniform growth conditions for precise control and replication of experimental variables that cannot be easily controlled in the field.

A facility of approximately 7,300 square feet is planned to accommodate two large growth chambers containing 288 2-gallon pots each, with conveyances to a series of automated imaging stations that can be used to image plants from any greenhouse or growth space on campus. The exterior of the project has been designed to complement the existing masonry-faced Life Science Plant and Soils Laboratory building and to relate to the newer designs of the southwest campus structures. The facility will be located southwest of the existing Life Science Plant and Soils Laboratory on the current site of the Life Science Range #2 Greenhouse, which is scheduled for demolition as part of this project. The site plan is in alignment with the College of Agriculture's strategic plan.

The existing dirt floor in the greenhouse does not function to the level needed for some research as it is difficult to control temperature and to sanitize. The new Controlled Environment Phenotyping Facility will replace an existing greenhouse with new plant research and growth space that is more technologically advanced and more applicable to current research.

There is a potential for two additional phases that consist of a building addition for soils handling and preparation and an automated greenhouse.

**Need and Purpose of the Program**

The proposed project is part of the Purdue Moves Plant Sciences Initiative and is a key component in Purdue's leadership in plant phenotyping, crop development and fundamental plant research. The facility is critical to Purdue's ability to respond to grants and meet industry needs as it allows use of sophisticated, high-throughput technologies to advance basic and applied plant science.

Other universities will likely follow this trend and quickly adopt and develop new technologies. To be competitive for funding from the National Science Foundation's \$75 million INFEWS program (Innovations at the Nexus of Food, Energy and Water Systems), it is critical for advanced technologies to be a part of the proposals. The \$200 million Foundation for Food and Agricultural Research also expects researchers to be using these types of technologies. Without this facility, Purdue's federal funding in plant biology is at risk. In addition, there have been a number of industry partners who have already approached Purdue with interest in collaborative use of this new system.

In the 2012 Master Plan for the College of Agriculture, the replacement and/or upgrading of plant growth facilities / greenhouses was noted as a goal. The implementation of the Purdue Moves Plant Sciences Initiative brought forward the need to upgrade some of the plant growth facilities at this time. The Plant Sciences Initiative supports research in several crops and model organisms. Some plants will be grown in a crop production environment, and some phenotyping measurements will be obtained outdoors. The speed and accuracy of other phenotyping tools used to identify desirable genetic lines benefit from a controlled-growth environment.

Students at Purdue will get an experience that is second to none. This project will enable students to work in teams across departments and colleges and allow them to link information from controlled environments to the field; no other institution has these state-of-the-art capabilities. If this project is not approved, Purdue will not be as competitive for research funding without this capability and students will continue to be exposed to outdated greenhouse facilities which do not create a good training environment, limit the type of research that can be done without advanced imaging and will prevent our students from being exposed to the type of automation that is present in today's industry.

**Space Utilization**

The location of the project will require the demolition of 3,780 ASF (rooms 021, 022, 023 and 024) in the Life Science Ranges #2 building. All 3,780 ASF is in the 500-Special Use Facilities major room classification and is academic space. The project will construct 4,567 ASF of 250-Non-Class Lab space, which is also academic space, resulting in a net change to campus square footage of 787 ASF and 3,326 GSF.

**Comparable Projects**

Not applicable.

**Background Materials**

See attached "Future Site Map for the Controlled Environment Phenotyping Facility" and "Site Development Plan".

**CAPITAL PROJECT REQUEST FORM  
INDIANA PUBLIC POSTSECONDARY EDUCATION  
INSTITUTION CAMPUS SPACE DETAILS FOR: CONTROLLED ENVIRONMENT PHENOTYPING FACILITY**

B-1-16-1-07	Current Space in Use	Space Under Construction (1)	Space Planned and Funded (1)	Subtotal Current and Future Space	Space to be Terminated (1)	New Space in Capital Request (2)	Net Future Space
<b>A. OVERALL SPACE IN ASF</b>							
Classroom (110 & 115)	294,999	57,000	5,570	357,569	-	-	357,569
Class Lab (210,215,220,225,230,235)	558,521	6,669	30,465	595,655	-	-	595,655
Non-class Lab (250 & 255)	1,516,901	4,720	22,446	1,544,067	-	4,567	1,548,634
Office Facilities (300)	2,174,719	10,717	28,737	2,214,173	-	-	2,214,173
Study Facilities (400)	378,419	42,063	1,995	422,477	-	-	422,477
Special Use Facilities (500)	1,153,610	-	57,584	1,211,194	3,780	-	1,207,414
General Use Facilities (600)	878,243	28,934	3,901	911,078	-	-	911,078
Support Facilities (700)	3,250,989	1,785	(33,723)	3,219,051	-	-	3,219,051
Health Care Facilities (800)	88,792	-	-	88,792	-	-	88,792
Resident Facilities (900)	2,326,563	132,144	-	2,458,707	-	-	2,458,707
Unclassified (000)	30,021	-	-	30,021	-	-	30,021
<b>B. OTHER FACILITIES</b>							
(Please list major categories)	-	-	-	-	-	-	-
<b>TOTAL SPACE</b>	<b>12,651,777</b>	<b>284,032</b>	<b>116,975</b>	<b>13,052,784</b>	<b>3,780</b>	<b>4,567</b>	<b>13,053,571</b>

Notes:

(1) Identify in a footnote the specific facilities that are included in the data in these columns. Do not include pending approval, non-submitted projects or non-funded projects

(2) Should include capital projects requested by the institution based on 2013-15 Capital Request Summary

- Space/Room codes based on Postsecondary Ed Facilities Inventory and Classification Manual (2006)

Space under construction includes: Thomas S. and Harvey D. Wilmeth Active Learning Center (WALC), Honors College and Residences North (HCRN), Honors College and Residences South (HCRS), Zucrow High Pressure Research Lab Test Cells and Control Center (ZL3 and ZL8)

Space planned and funded includes: Bechtel Innovation Design Center, Hobart & Russell Creighton Hall of Animal Sciences and Land O'Lakes Center, Football Performance Complex

Space to be terminated includes: Life Science Ranges #2 Building (LSR) Rooms 021, 022, 023, 024

**CAPITAL PROJECT COST DETAILS  
FOR: CONTROLLED ENVIRONMENT PHENOTYPING FACILITY**

<b>Institution:</b>	Purdue University	<b>Budget Agency Project No.:</b>	B-1-16-1-07
<b>Campus:</b>	West Lafayette	<b>Institutional Priority:</b>	N/A

**ANTICIPATED CONSTRUCTION SCHEDULE**

	<u>Month</u>	<u>Year</u>
<b>Bid Date</b>	November	2016
<b>Start Construction</b>	February	2017
<b>Occupancy (End Date)</b>	February	2018

**ESTIMATED CONSTRUCTION COST FOR PROJECT**

	<u>Cost Basis (1)</u>	<u>Estimated Escalation Factors (2)</u>	<u>Project Cost</u>
<b><u>Planning Costs</u></b>			
a. Engineering			\$ 167,000
b. Architectural			\$ 167,000
c. Consulting			\$ -
<b><u>Construction</u></b>			
a. Structure			\$ 1,161,823
b. Mechanical (HVAC, plumbing, etc.)			\$ 518,337
c. Electrical			\$ 439,897
<b><u>Movable Equipment</u></b>			\$ -
<b><u>Fixed Equipment</u></b>			\$ 3,190,803
<b><u>Site Development/Land Acquisition</u></b>			\$ -
<b><u>Other (Please list)</u></b>			\$ 605,140
<b>TOTAL ESTIMATED PROJECT COST</b>		\$ -	\$ 6,250,000

(1) Cost Basis is based on current cost prevailing as of: (INSERT MONTH AND YEAR)

(2) Explain in the Description of Project Section of the "Cap Proj Details" schedule the reasoning for estimated escalation factors

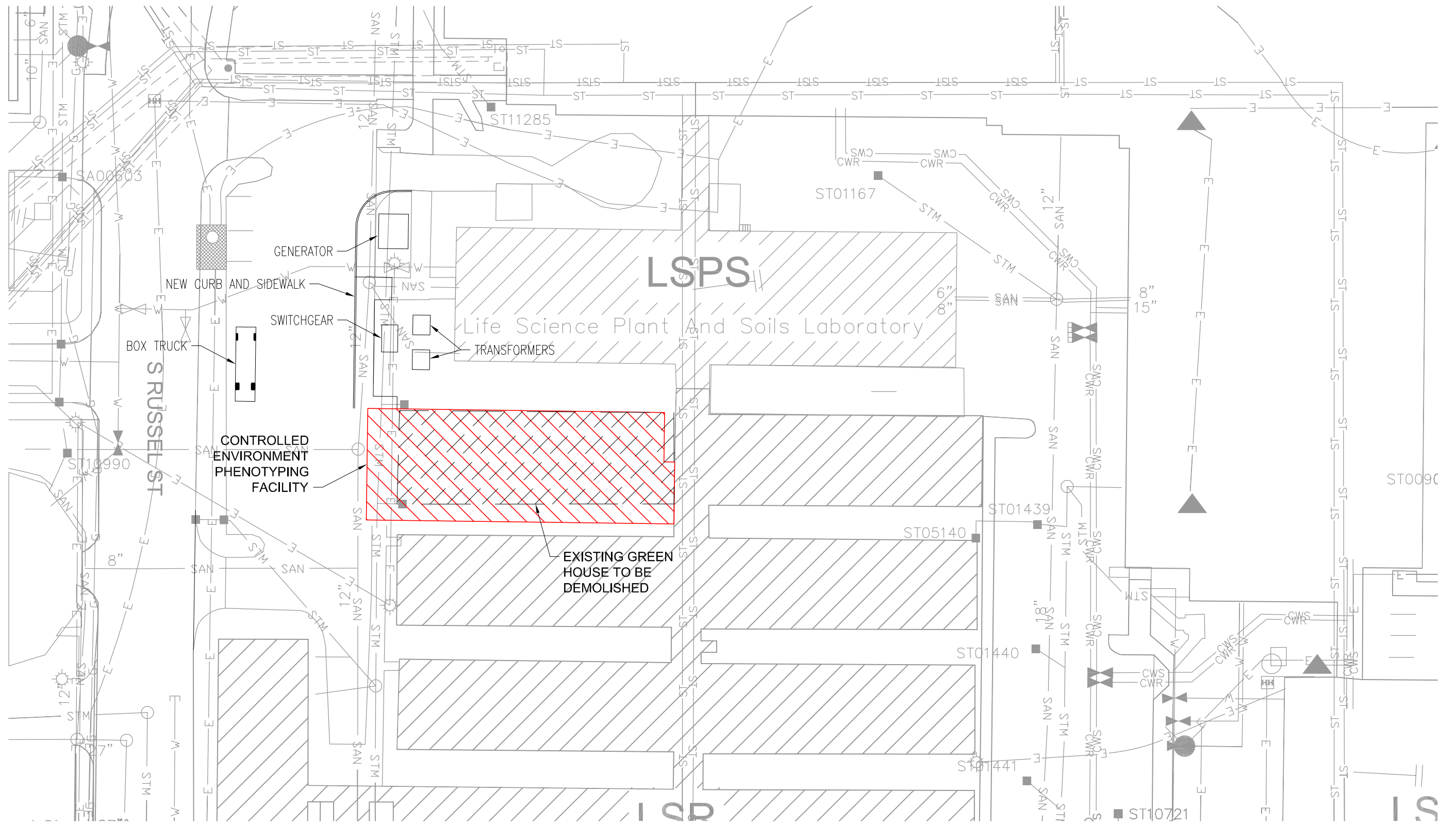
**CAPITAL PROJECT OPERATING COST DETAILS  
FOR: CONTROLLED ENVIRONMENT PHENOTYPING FACILITY**

<b>Institution:</b>	<b>Purdue University</b>	<b>Budget Agency Project No.:</b>	<b>B-1-16-1-07</b>	
<b>Campus:</b>	<b>West Lafayette</b>	<b>Institutional Priority:</b>	<b>N/A</b>	
<b>ANNUAL OPERATING COST/SAVINGS (1)</b>				<b>GSF OF AREA AFFECTED BY PROJECT</b>
				<b>6,703</b>
	<b>Cost per GSF</b>	<b>Total Operating Cost</b>	<b>Personnel Services</b>	<b>Supplies and Expenses</b>
1. Operations	\$ 3.50962256	\$ 23,525	\$ 20,048	\$ 3,477
2. Maintenance	\$ 1.38355960	\$ 9,274	\$ 7,347	\$ 1,927
3. Fuel	\$ -	\$ -		
4. Utilities	\$ 2.89243622	\$ 19,388		\$ 19,388
5. Other	\$ -	\$ -		
<b>TOTAL ESTIMATED OPERATIONAL COST/SAVING</b>	<b>\$ 7.78561838</b>	<b>\$ 52,187</b>	<b>\$ 27,395</b>	<b>\$ 24,792</b>
<b>Description of any unusual factors affecting operating and maintenance costs/savings.</b>				

(1) Based on figures from "Individual Cap Proj Desc" schedule







**SITE DEVELOPMENT PLAN**