

Oak Ridge Institute for Science and Education (ORISE)

FY2014/FY2015 Ten-Year Site Plan

January 2015

The Oak Ridge Institute for Science and Education (ORISE) is a U.S. Department of Energy institute focusing on scientific initiatives to research health risks from occupational hazards, assess environmental cleanup, respond to radiation medical emergencies, support national security and emergency preparedness, and educate the next generation of scientists. ORISE is managed by Oak Ridge Associated Universities.

This document describes activities performed under contract number DE-AC05-06OR23100 between the U.S. Department of Energy and Oak Ridge Associated Universities.

Foreword

Oak Ridge Associated Universities (ORAU) manages two sites and fourteen buildings in Oak Ridge, Tennessee in conducting the programs for the Oak Ridge Institute for Science and Education (ORISE). In accordance with U.S. Department of Energy (DOE) guidance, this document has been tailored commensurate with the size and nature of the ORISE site.

Executive Summary

Since 2001, ORISE has been engaged in a multi-year site consolidation and facilities modernization plan. In 2001, 24 DOE-owned buildings were occupied at five DOE sites in Oak Ridge. The largest portion of the building space was of World War II era construction, or earlier. Through an extensive effort to consolidate program and business operations, modernize existing facilities, construct new facilities, and transfer or demolish excess facilities, the site now consists of only nine DOE-owned buildings at a single DOE site. By the end of 2017, only six DOE-owned buildings will be occupied, with more than 35% of the space being 15 years old or less. A second site and five buildings utilized in Oak Ridge are owned by ORAU and a small space in an Oak Ridge hospital is also utilized. In addition to these facilities, some program operations are housed at the Oak Ridge National Laboratory (ORNL) as well as in contractor-leased space in Arlington, Virginia and Belcamp, Maryland.

Currently, the overall site Asset Utilization Index (AUI) is 96.49%, and the Asset Condition Index (ACI) is 0.998. Indirect facility budgets will continue to be managed closely and the site will coordinate with the DOE Headquarters (HQ) landlord to secure General Plant Project (GPP) funds, ensuring sufficient investment in existing facilities to keep them functionally up-to-date and energy efficient; adapt them to changing program operational requirements; ensure worker health, safety, and security; and maintain high overall building usage efficiencies.

Overview of Site Facilities and Infrastructure

As of January 2015, ORISE operations were conducted at 14 buildings ([REDACTED]) located at one DOE site and one site owned by ORAU. These sites are referred to as the South Campus site and the Main Campus site, respectively. Both are within the City of Oak Ridge, Tennessee. Additionally, a 9,004 gsf space in a nearby Oak Ridge hospital houses the Radiation Emergency Assistance Center/Training Site operations. Finally, operations are conducted in office and laboratory/research space located at other facilities on the Oak Ridge Reservation and in government-owned and contractor-leased office space in other parts of the country.

Of the Oak Ridge facilities, nine are DOE-owned, totaling 104,249 gsf of space. Two of these buildings are currently pending demolition, which will occur in FY2015. Five buildings, totaling [REDACTED] are owned by ORAU. Approximately [REDACTED] of this space is used in support of the ORISE contract. Construction of a new [REDACTED] contractor-owned office building, completed in February 2009, eliminated the need for Oak Ridge leased space.

support of the ORISE contract. This does not include more than 230 employee participants working at ORNL and other locations. Projections for staffing and funding to ten years in the future are presented in Table 3, below.

Table 3. Staffing and Funding Projections (Fiscal Year)											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Funding (\$M)	251	256	261	266	271	276	282	287	293	299	305
Staffing	608	608	608	608	626	645	664	684	704	725	747

Additional information regarding business programs and capabilities may be accessed via the Internet on the ORISE Home Page, <http://orise.orau.gov>.

Facilities and Infrastructure Vision and Strategy

The site seeks to maintain a high-quality working environment that is modern and attractive, healthy, safe and secure, technologically up-to-date, economically efficient, conducive to productive work, and fully capable of meeting current and future mission requirements. To this end, a long-range facilities consolidation and modernization plan was developed in 2001, along with a series of interim goals, explained in detail in the Land Use and Facility Planning section below. Completion of the 2001 plan was realized with the transfer of Building 2715 to DOE/Oak Ridge Operations (ORO) in July 2012 and transfer of the South Illinois Avenue site to the U.S. Department of Commerce in December 2012.

Site operations will continue to utilize a combination of expense and GPP funding to maintain and modernize the DOE-owned infrastructure and to demolish excess facilities that no longer have a foreseeable mission. Finally, routine preventive and corrective maintenance activities will be maintained at a sufficient level that will ensure existing facilities, equipment, and systems are maintained in excellent operating condition and the site ACI remains at or above established goals.

Space Management & Utilization

Over the years, the need for research, laboratory, and animal care space has diminished and given way to the need for office space, which is currently the dominant space-use type. The facility has been proactive in adapting existing space to meet changing needs as well as improving overall building usage efficiency. More information on the primary space usage types is listed in Table 4, below.

Table 4. Building Primary Usage Type (GSF, Operating Buildings Only)			
	Office & Administrative	Laboratory	Storage & Warehouse
DOE-Owned Facilities	57,266	13,365	29,956
Contractor-Owned Facilities		0	0
Total - All Facilities		13,365	29,956

Land Use and Facility Planning

In September 2001, in conjunction with DOE/ORO and others, ORISE participated in a space management review of all of the DOE-owned facilities that are located within the city limits of Oak Ridge to determine their most effective use. As part of this review, ORISE demonstrated the many benefits of consolidating its Oak Ridge operations to just three managed sites – the South Campus and South Illinois Avenue sites (DOE-owned) and the Main Campus site (contractor-owned). This vision would allow (1) vacating the Vance Road Building, permitting its eventual transfer to the private sector, (2) vacating the ORISE occupied section of Building 1916T2 and three Laboratory Road buildings, making them available for DOE/ORO exclusive use, and (3) locating all laboratory operations at a single site. A fourth goal, transfer the South Illinois Avenue site and facilities to the U.S. Department of Commerce, was subsequently added to the plan. The final action in the consolidation and modernization plan was completed in December 2012.

In FY2011, Phase 1 of a large, two-part site improvement project at the South Campus site was completed. This project was integral to the facility consolidation and modernization effort and included roadway, walkway, parking, area drainage, utility system, and exterior lighting system improvements. The final construction phase, which includes extensive road, parking lot, utility system, and pedestrian safety improvements, is currently scheduled to begin in FY2018. ORISE will also continue to construct new facilities and expand and modernize existing facilities as funding permits and to excess and demolish low-quality, underutilized buildings at the South Campus site. In August 2013, a 4,152 gsf expansion to the SC-10 laboratory building was completed. Construction of a nominal 6,000 gsf expansion of the SC-200 warehousing facility is expected to begin in FY2016. As part of or immediately following the SC-200 expansion project, three existing, low-quality storage buildings (total 8,163 gsf) will be excessed and demolished – SC-9 and SC-16 in FY2015 followed by SC-13 in FY2017. Appendix 1 and Appendix 2 provide a graphical illustration of the ORISE Facilities Consolidation and Modernization Plan.

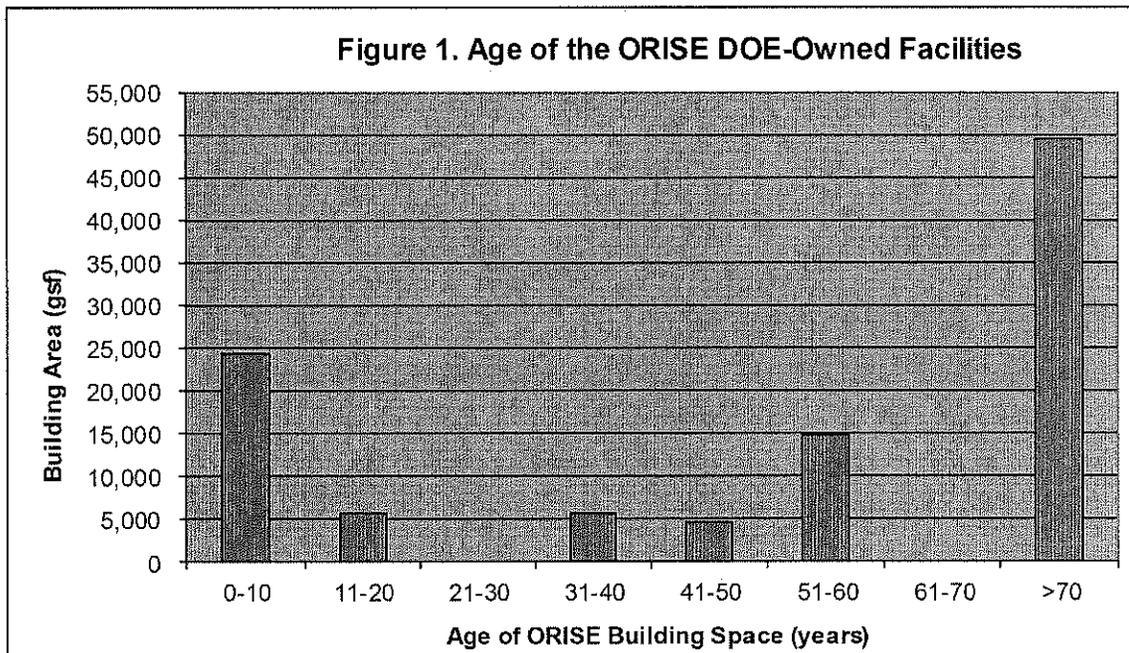
Finally, as an extension of the ongoing modernization effort, ORAU continues to invest heavily in capital improvements at its own facilities. In 2004, construction of Building MC-212, [REDACTED], was completed. Almost all of this space is dedicated to ORISE operations. In 2009, a [REDACTED] project to expand the central computer center was completed. This project greatly increased data server capacity and reduced business continuity risk. Also in 2009, construction of Building MC-100 was completed – [REDACTED] Center for Science Education Building, housing ORISE program and support staff [REDACTED]. Construction of this building allowed the elimination of all leased space within the City of Oak Ridge. In 2014, an [REDACTED] replacement of the heating, ventilation, and air conditioning (HVAC) system in the east and center wings of Building MC-120 was completed. The construction of buildings MC-100 and MC-212 notwithstanding, over the past ten years ORAU has completed an average of nearly [REDACTED] per year in capital infrastructure improvements to its own facilities in direct support of ORISE operations.

Disposition and Long Term Stewardship of Excess Facilities

Currently, seven of the nine DOE-owned buildings are listed as “Operating” in the DOE Facilities Information Management System (FIMS) database. Two buildings, scheduled for demolition in FY2015, are listed as “Shutdown Pending Disposal”. Building SC-13, another small, low-quality storage building, programmatically required until completion of the Building SC-200 expansion project, will eventually be declared as excess and is currently planned for demolition in FY2017.

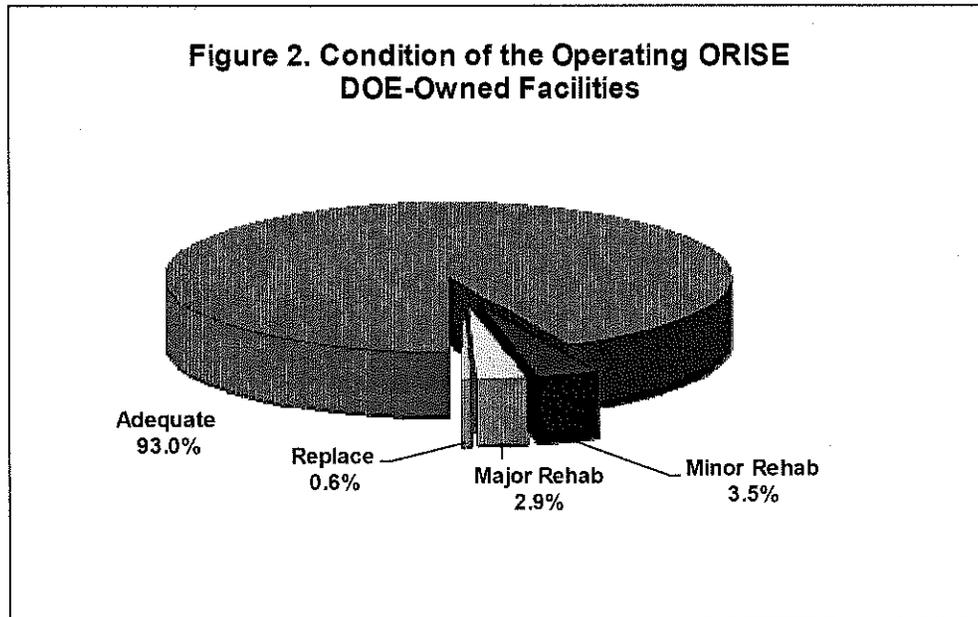
Facility Condition and Condition Assessment Process

As can be seen in Figure 1, a large portion of the DOE-owned space was constructed during or prior to the World War II era. The average building age is currently 36.8 years. Because of this, many of these buildings have required extensive maintenance support, major system improvements (e.g., HVAC, electrical, computer network, telecommunications), and interior space reconfiguration to efficiently meet changing program operational requirements and to ensure worker health, safety, and security.



Since 1993, the facility has been successful in obtaining GPP funding through the DOE/HQ landlord office to implement capital improvements at the DOE-owned buildings. The site has also utilized overhead expense funds and direct funding sources to finance energy conservation projects, larger-scale maintenance projects, and other infrastructure improvement projects. Together, these projects have greatly enhanced building utilization efficiency and significantly reduced facility operating and maintenance costs. Currently,

93.0% of the operating DOE-owned space is considered to be adequate to meet program needs with only 2.9% requiring major rehabilitation and 0.6% needing replacement. Figure 2 provides a graphical representation of the current condition of the ORISE operating facilities.



Site engineering and maintenance personnel conduct an annual informal condition assessment survey of all buildings and grounds to identify and document needed maintenance repair projects. Also, in a somewhat continuous process, maintenance repair tasks are identified by other means: routine management walk-downs, maintenance employee and customer observations, program requests, etc. In addition to the above, the site also conducts formal, third-party condition assessments of its facilities. The most recent formal condition assessment survey occurred in May 2012. Table 5, on the following page, provides additional information regarding the condition and utilization of the facilities. Most of this information is also available online in the DOE FIMS Database.

Table 5. FY2014 Site Infrastructure Data Snapshot							
Total ORISE Site RPV	\$21,554,947						
Total Deferred Maintenance	\$46,211						
Total DOE Owned Acreage	169						
Total DOE Leased Acreage	0						
Asset Condition Index (All Facilities)		Building Assets	Trailer Assets	OSF Assets	GSF (Bldg)	GSF (Trailer)	
Site-Wide	0.998						
Mission Critical	0.998	3	0	2	65,058	0	
Mission Dependent	0.998	4	0	2	35,529	0	
Not Mission Dependent	N/A	2	0	0	3,662	0	
Asset Utilization Index (Operating Facilities Only)		Building Assets	Trailer Assets			GSF (Bldg)	GSF (Trailer)
Site-Wide	96.49%						
Office	100.00%	3	0			57,266	0
Warehouse	89.11%	2	0			29,956	0
Laboratory	100.00%	2	0			13,365	0
Hospital	0.00%	0	0			0	0
Housing	0.00%	0	0			0	0
Ref: FIMS Report #200 updated to November 2014							

Facilities Sustainment Program and Management of Deferred Maintenance

A number of processes are managed to ensure the facilities are maintained in a suitable condition to efficiently and effectively carry out program missions, both now and in the future. These include:

- Identification of maintenance repair projects through a combination of formal and informal facility condition assessment surveys.
- Identification and management of capital infrastructure improvement projects.
- Management of corrective maintenance and preventive maintenance (PM) programs.
- Deferred maintenance (DM) project management – identification, backlog tracking, prioritization, and reporting.
- Maintenance and capital project budget management – includes management of facility Maintenance Investment Index (MII) requirements.

A combination of formal and informal facility condition assessment surveys are used to identify and document corrective maintenance projects. Corrective maintenance projects may be integrated into the current work plan or, for lower priority projects, logged into a maintenance backlog database and re-prioritized at frequent intervals. Projects approved for work are then planned and moved into the work order system for scheduling and processing. DM projects are identified during periodic reviews of the maintenance backlog. All DM

projects are tracked from the time they are identified until completed. Database reporting software allows the development of a variety of reports based on the query of one or more data parameters. A number of standard reports have been developed, such as those that track the DM backlog.

In addition to the corrective maintenance program, the site manages an outstanding PM program. For this purpose, a PM Database software application was developed that automatically schedules PM regimens for nearly every individually maintainable equipment item at the facility, including building envelope subsystems. Most of the building-related equipment items have monthly PM task assignments, while many others have weekly PMs – all scheduled automatically by the PM Database. For more than 21 years, the site has compiled an outstanding track record for completing scheduled PM tasks. During this period, facilities have experienced significantly reduced equipment repair costs, fewer maintenance call-outs, and little or no significant seasonal, weather-related losses. The strong commitment to this program has enabled employees to work productively by keeping building systems in top operating condition and equipment failures to an absolute minimum.

The site ensures that facility maintenance is adequately funded by budgeting for and tracking all expense and capital maintenance-related expenditures. As a part of this process, the site reports maintenance expenditures quarterly and measures them against MII goals. See Table 6 for additional information regarding RPVs and the maintenance funding plan from FY2014 to FY2024. Note that maintenance funding plan figures in Table 6 reflect an update of the ORISE crosscut budget submitted to DOE in April 2014.

Table 6 RPV and Maintenance Funding Projections				
Year	RPV Reductions	RPV Additions	Total RPV	Maintenance Funding Plan
FY2014			\$21,554,947	\$431,099
FY2015	\$319,047		\$21,724,326	\$434,487
FY2016			\$22,223,985	\$444,480
FY2017	\$410,390	\$1,560,000	\$23,875,308	\$477,506
FY2018			\$24,424,440	\$488,489
FY2019			\$24,986,202	\$499,724
FY2020			\$25,560,885	\$511,218
FY2021			\$26,148,785	\$522,976
FY2022			\$26,750,207	\$535,004
FY2023			\$27,365,462	\$547,309
FY2024			\$27,994,868	\$559,897
* Annual RPV Escalation 2.3%				

A database of needed capital infrastructure improvement projects is also maintained. Capital projects may be identified in much the same way as for maintenance repair projects. More frequently, however, capital construction projects are developed after managerial review and discussion of current and future program mission needs. Each capital project is evaluated and

prioritized. Project priority is further evaluated and refined in conjunction with the DOE ORNL Site Office (OSO) and the facility landlord office. These capital projects are direct funded through the landlord office utilizing GPP funds [REDACTED]

[REDACTED] As with maintenance repair projects, capital infrastructure improvement projects are implemented in a prioritized fashion as funding becomes available.

Site Space Bank Analysis

Table 7 shows the projected changes in ORISE contributions to the DOE space bank. This table was developed to coincide with the most recent landlord GPP funding guidance, the recent DOE Freeze the Footprint initiative, and completion of capital projects in accordance with the GPP planning schedule in Appendix 3.

Table 7. Space Bank Analysis				
Year	Additions (gsf)	Removals (gsf)	Net Change (gsf)	Available Offsetting Space (gsf)
FY2010 Balance				44,007
FY2011	2,243		2,243	41,764
FY2012				41,764
FY2013	4,152		4,152	37,612
FY2014				37,612
FY2015		(3,662)	(3,662)	41,274
FY2016	6,000		6,000	35,274
FY2017		(4,501)	(4,501)	39,775
FY2018				39,775
FY2019				39,775
FY2020				39,775
FY2021				39,775
FY2022				39,775
FY2023				39,775
FY2024				39,775

Capital Investment Plan

The site capital project implementation schedule was revised in FY2007 to accommodate reductions in landlord GPP funding levels and changing priorities. No DOE capital funding was received in FY2013 and only \$250K in FY2014. The funding reductions have caused many project starts to be delayed for one or more years from original planning and some projects to require funding spanning more than a single year. Reference the ORISE FY2016 Crosscut Budget, Section 2 (Appendix 3) for additional information regarding facility capital investment planning out to FY2020.

Energy Management and Sustainability

The site continues to pursue an aggressive energy management and sustainability program that is based on sound energy management and environmental stewardship practices and to remain in compliance with DOE orders, executive orders, and DOE sustainability goals. As part of this effort, ORISE maintains an up-to-date sustainability plan and conducts periodic, third-party facility energy audits – the most recent occurring in FY2013. Viable energy conservation opportunities (ECOs), identified in the FY2013 energy audit, are currently being implemented based on energy savings potential and available funding.

In 1993, the site began implementation of a structured, long-range energy management and sustainability program with goals of reducing energy, water, and petroleum-based fuel consumption and reducing waste and emission streams to their lowest possible level. Elements of this program include the following:

- Integrating sustainable work practices into all facets of facility operations.
- Conducting facility energy audits to identify viable ECOs.
- Pursuing energy conservation project funding from a number of sources.
- Implementing life-cycle, cost-effective energy conservation retrofit projects.
- Consolidating and modernizing facilities.
- Conducting life-cycle cost studies as part of all new and major retrofit construction project engineering designs and incorporating the most energy-efficient equipment and water-efficient fixtures into the final design.
- Mandating the use of post-consumer materials in new construction and maximizing the reuse and recycle of demolished materials and equipment.
- Maintaining energy-consuming, facilities-related equipment in top mechanical condition and operating it in the most energy-efficient manner.
- Supporting local utility initiatives by participating in renewable power source opportunities.
- Selecting and purchasing certified Energy Star[®] office equipment and appliances, energy-efficient building equipment, and low-consumption water system components.
- Tracking and reporting energy, water, and fuel consumption and related costs.
- Shrinking the vehicle fleet size and reducing dependency on petroleum-based fuels.
- Evaluating custodial chemicals and using “green” chemicals whenever practical.
- Converting to effective, but more environmentally friendly pest control and groundskeeping chemicals.
- Educating employees in energy conservation awareness, energy-saving techniques, and sustainable design and operating practices.

As a result of this aggressive program, the site continues to achieve outstanding results in reducing building energy consumption. In FY2013, the ORISE buildings consumed 84,370 BTU/gsf versus 212,537 BTU/gsf for the average DOE Office of Science building. Energy

conservation measures implemented in the past year further reduced the facility energy intensity by 4.5% to 80,545 BTU/gsf, 49% below the 1993 level and nearly 32% below the 2003 level. At this time, there are no ECO projects of sufficient size to warrant consideration for third-party, energy-savings performance contract (ESPC) funding.

To improve energy efficiency and reduce operating costs, facility engineering systematically performs retro-commissioning of all buildings. Nearly all of the employee-occupied building space has recently completed the retro-commissioning process. Several identified energy conservation opportunities that are common to many of the buildings include: replacing aging equipment with that of high-efficiency design, reducing excessive building outside air intake, reducing lighting levels in over-illuminated spaces, re-lamping to lower wattage fluorescent bulbs, improving exterior lighting efficiency, reducing or eliminating reheat in HVAC systems, and implementing night setback HVAC system operations in buildings not originally designed to operate in this mode. Table 8, below, provides the current status of the FY2009-FY2019 ORISE sustainability projects.

Table 8. Energy Conservation and Sustainability Projects				
Conservation Measure	Funding	Proposed Completion	TEC (\$)	Current Status
Comprehensive Energy Audit	Indirect	2009	\$55,000	Complete
Retro-commission SC-100	Indirect	2009	\$3,000	Complete
Retro-commission SC-200	Indirect	2009	\$10,000	Complete
Retro-commission SC-1	Indirect	2010	\$20,000	Complete
Decrease lighting wattage – SC-100	Indirect	2010	\$300	Complete
On-site photovoltaic SC-100 exterior lighting	Indirect	2010	\$50	Complete
Replace SC-1 chiller with high efficiency	Indirect	2011	\$70,000	Complete
ORISE exterior lighting audit	Indirect	2011	\$2,000	Complete
Replace SC-1 boiler with high efficiency	Indirect	2012	\$175,000	Complete
SC-100 Lighting Improvements	Indirect	2013	\$500	Complete
Comprehensive Energy Audit	Indirect	2013	\$15,200	Complete
Reduce SC-100 reheat	Indirect	2014	\$4,000	Complete
Replace SC-100 boilers with high efficiency	Indirect	2014	\$25,000	Complete
SC-1 exterior and insulation improvements	GPP	2018	\$900,000	Identified
Decrease lighting wattage – SC-1	Indirect	2019	\$800	Identified

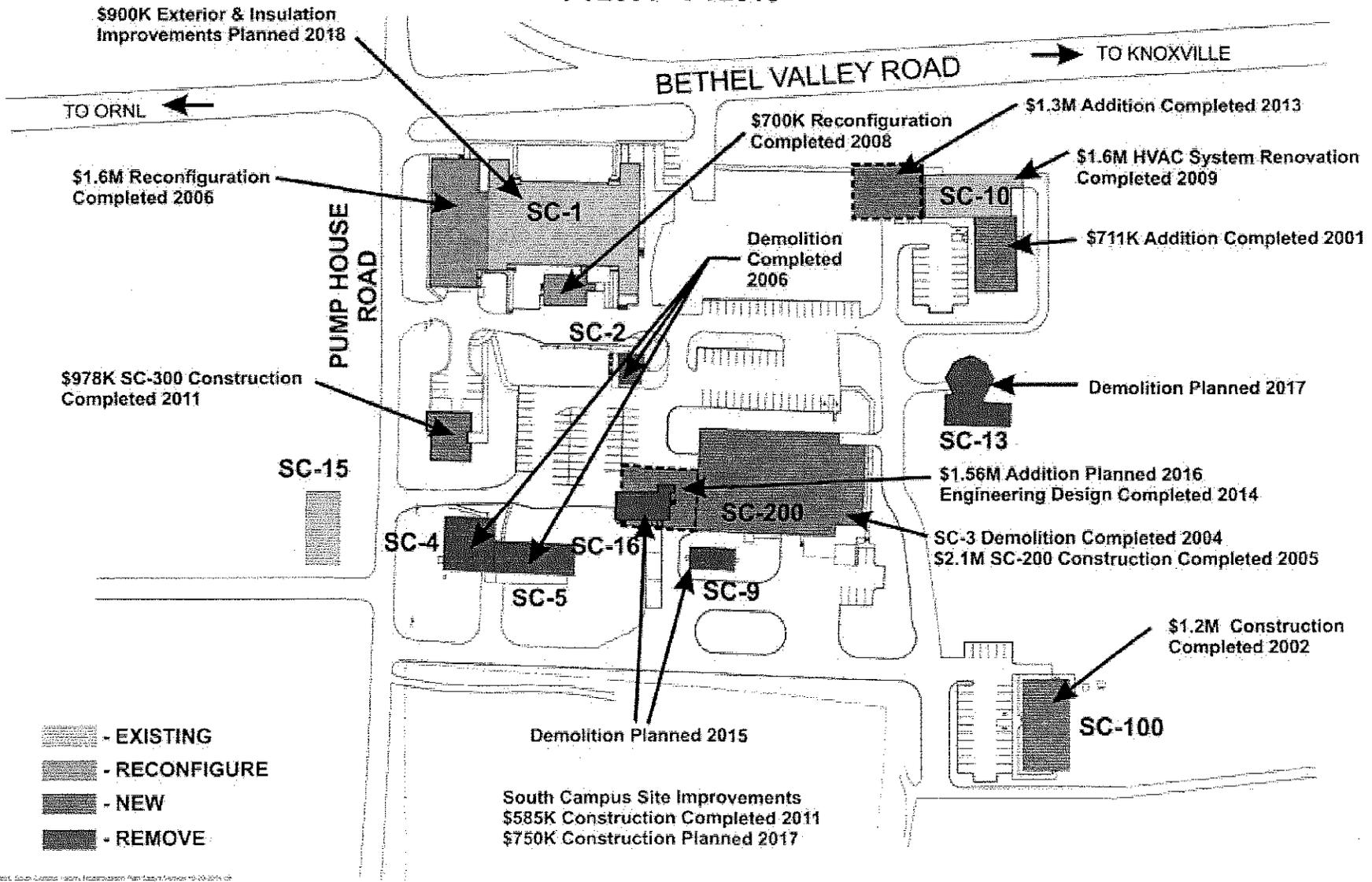
Summary of Resource Needs

See Appendix 3 for the ORISE Ten-Year Funding Plan (Integrated Facilities and Infrastructure Crosscut Budget).

ORISE Contacts

[Redacted contact information]

Appendix 2 ORISE South Campus Facility Modernization Plan FY2001 - FY2018



ORISE South Campus Facility Modernization Plan (Appendix 2) 10/20/14
REV: 10/20/14

Appendix 3
ORISE FY2016 Crosscut Budget (June 2014)

2016
Science
Oak Ridge Institute for Science and Education

Integrated Facilities and Infrastructure (IFI)
Budget Data Sheet

	Prior Year FY 2014 Costs (\$000)	Current Year FY 2015 Costs (\$000)	Budget Year FY 2016 Costs (\$000)	Budget Year FY 2017 Costs (\$000)	Budget Year FY 2018 Costs (\$000)	Budget Year FY 2019 Costs (\$000)	Budget Year FY 2020 Costs (\$000)
1.0 Capital Asset Projects in Excess of \$10M							
1.1 Direct	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1.2 Indirect	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1.0 Total Direct and Indirect Capital Asset Projects in Excess of \$10M	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.0 General Plant Projects							
2.1 Direct (GPPs)	\$120	\$230	\$1,310	\$850	\$700	\$200	\$700
2.2 Direct Accelerator Improvement Projects	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.3 Indirect (IGPPs)	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.4 Indirect Accelerator Improvement Projects	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2.0 Total General Plant Projects (GPPs + IGPPs) & AIPs	\$120	\$230	\$1,310	\$850	\$700	\$200	\$700
3.0 Maintenance & Repair							
3.1 Direct Funded Maintenance & Repair							
3.1.1 Direct Predictive, Preventive, and Corrective M&R	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3.1.2 Direct Funded Deferred Maintenance Reduction	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3.1 Total Direct Funded Maintenance & Repair	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3.2 Indirect Funded Maintenance & Repair							
3.2.1 Indirect Predictive, Preventive, and Corrective M&R	\$431	\$434	\$444	\$457	\$468	\$478	\$489
3.2.2 Indirect Funded Deferred Maintenance Reduction	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3.2 Indirect Funded Maintenance & Repair	\$431	\$434	\$444	\$457	\$468	\$478	\$489
3.0 Total Direct and Indirect Maintenance and Repair	\$431	\$434	\$444	\$457	\$468	\$478	\$489
4.0 Disposal and Demolition							
4.1 Direct	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4.2 Indirect	\$0	\$0	\$0	\$60	\$0	\$0	\$0
4.0 Total Disposal and Demolition	\$0	\$0	\$0	\$60	\$0	\$0	\$0
5.0 Additions							
5.1 Replacement Plant Value (RPV)	\$21,555	\$21,724	\$22,224	\$22,851	\$23,376	\$23,913	\$24,463
5.2 Building Area (<i>thousands gross square feet</i>)	0	0	6	0	0	0	0

* Note - RPV figures in line 5.1 vary slightly from those listed in Table 6 due to recent changes in future year capital project estimates.