Department of Energy Laboratory Plan
For the Office of Science's
Ames Laboratory

Mission and Overview

Ames Laboratory (Ames) was formally established in 1947 by the United States Atomic Energy Commission as a result of the Ames Project's successful development of the most efficient process to produce high-purity uranium metal in large quantities for the Manhattan Project. Situated on the campus of Iowa State University, the M&O contractor, Ames' mission focus is on materials science, engineering, analytical instrumentation and chemical sciences that provides expertise to the Department of Energy (DOE) laboratory system in the areas of energy and environmental improvement. Ames operates the Materials Preparation Center (MPC) which provides capabilities in preparation, purification, fabrication and characterization of materials in support of R&D programs throughout the world. Ames also collaborates with the DOE's applied energy technology and nonproliferation programs and supports the National Institutes of Justice, Department of Defense, various law enforcement agencies, and corporate entities. Since 1984, Ames Laboratory has received 16 R&D 100 awards from R&D Magazine, which selects the 100 most significant technical products and innovations each year. Since 1947, over 3000 Masters and Ph.D. degrees in science and engineering have been awarded to ISU students working on Ames projects.

Laboratory Focus/Core Competencies

Five areas of core competency underpin activities at Ames Laboratory:

1. Materials design, synthesis and processing;
2. Analytical instrumentation/device design/fabrication, materials characterization, x-ray and neutron scattering, solid-state Nuclear Magnetic Resonance (NMR), spectroscopy/microscopy;
3. Catalysis;
4. Condensed matter theory (including photonic band gap and other novel materials); and
5. Separation science.

The Office of Science believes that these five competencies will enable Ames to deliver its mission and customer focus,

Lab-at-a-Glance

Location: Ames, IA

Type: Single-program laboratory

Contract Operator: Iowa State University (ISU) of Science and Technology

Responsible Field Office: Ames Site Office

Website: http://www.ameslab.gov/

Physical Assets:

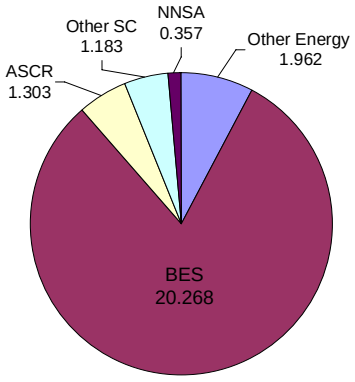
- 10 acres (lease–long term, no cost)
- 12 buildings
- 327,664 GSF in Active Operational Buildings
- Replacement Plant Value: $62.1M
- Deferred Maintenance: $1.5M
- Asset Condition Index:
  - Mission Critical 0.98 (Excellent)
  - Mission Dependent 0.96 (Good)
- Asset Utilization Index: 0.98 (Excellent)

Human Capital:

- 300 Full-time equivalent employees;
- 250 ISU grad/undergrad students employees and associates
- 200 Facility users, visiting scientists, and associates

FY 2007 Total DOE Funding: $25.1M

FY 2007 DOE Funding by Source
PALS data (BA in Millions):



FY 2007 Non-DOE Funding: $1.4M

to perform a complementary role in the DOE laboratory system, and to pursue its vision for scientific excellence and pre-eminence in the areas of:

- Fundamental materials research with emphasis in optical, magnetic, intermetallic, and catalytic materials; and studies of high temperature materials and the structure and properties of materials in extreme conditions.
- Analytical techniques and instrument development.

Business Lines/Distinguishing Characteristics

The following capabilities, aligned by business lines, distinguish Ames and provide a basis for effective teaming and partnering with other DOE laboratories, universities, and private sector partners in pursuit of the laboratory mission. These business lines and the distinguishing capabilities outlined in the table below provide an additional window into the mission focus and unique contributions and strengths of Ames and its role within the Office of Science laboratory complex. Items in italics within the column, "Distinguishing Capabilities", identify research facilities that convey particular, strategic strengths and capabilities to the Lab. Descriptions of these facilities can be found at the website noted in the Lab-at-a-Glance section of this Plan.

Business Lines	Distinguishing Capabilities	Distinguishing Performance	Mission Relevance
Fundamental Materials Research	• Novel optical materials; • Materials preparation, synthesis and processing;	Leader in photonic band gap materials and metamaterials; Dr. C. Soukoulis received the Descartes Prize for Excellence in Scientific Collaborative Research in FY2006 for his contributions to the field of left-handed materials. Recognized world leader in rare earth and intermetallic compounds. Dr. K. Gschneidner, Jr. named to National Academy of Engineering in FY2007 because of his contributions to rare-earth materials. In 2008, Dr. Gschneidner received the Acta Materialia Gold Medal, considered by many scientists and engineers to be the top award worldwide in the field of materials research. Dr. I. Anderson's lead free solder technology is being licensed worldwide (more than 75 licenses). In 2007, Dr. Anderson received the Distinguished Scientist/Engineer Award by the Electronic, Magnetic & Photonic Materials Division of the Minerals, Metals, & Materials Society; only the second person selected for the award. Dr. Paul Canfield was consulted by a National Academy of Sciences Panel on the current status and future prospects of crystal	Advance Basic Sciences for Energy Independence BES's Grand Challenges: • Controlling material processes at the level of electrons (photons); • Design of atom-and energy-efficient synthesis of revolutionary new forms of matter with tailored properties; • Understanding of how remarkable properties of matter emerge from complex correlations of the atomic or electronic constituents and how to control these properties; • Mastering energy and information on the nanoscale to create new technologies with capabilities rivaling those of living things; and • Characterizing and controlling matter away from equilibrium. Synthesis and characterization of the next generation of

Business Lines	Distinguishing Capabilities	Distinguishing Performance	Mission Relevance
		growth. An Academy report is due out in Summer, 2008.	materials for energy efficiency/storage, communications, and environmental stewardship.
	• Magnetic materials and correlated electron systems;	Pioneering work on environmentally-benign refrigeration and magnetic molecules; Ames Laboratory is working with Astronautics Corporation of America to develop magnetic refrigeration technology; a R&D 100 Award winner. Dr. Marshal Luban received an Honorary Doctorate from the University of Osnabruck, Osnabruck, Germany for promoting "the field of Molecular Magnetism by his own work as well as by initiating international cooperations."	
	• Complex intermetallic compounds; and	Leader in quasi-crystals; properties of complex materials; Hosted the Ninth Annual World Quasicrystals Conference in 2006; Dr. Pat Thiel received the Doctor Honoris Causa from the Institute National Polytechnique de Lorraine for her work on quasicrystals. Dr. John Corbett received the American Chemical Society's 2008 F. Albert Cotton Award in Synthetic Inorganic Chemistry which recognizes individuals who have distinguished themselves by demonstrating creativity, imagination and outstanding synthetic accomplishments in the field of inorganic chemistry. With his selection for the Cotton Award, Dr. Corbett has now received all three American Chemical Society awards in inorganic chemistry.	
	• Catalytic materials.	Besides inventing a new environmentally friendly nanosphere-based catalyst for biodiesel production, Dr. V. Lin is pioneering work on novel structures; high-specificity reaction, controlled drug release; Dr. V. Lin has developed materials to cap mesoporous nanospheres, hold the drugs in place and release the drugs at a specific site. Dr Lin received the National Science Foundation Career Award.	
	• *Materials Preparation Center;* • *Scalable Computing Lab.*		

Business Lines	Distinguishing Capabilities	Distinguishing Performance	Mission Relevance
Analytical Techniques and Instrument Development	• Solid-state Nuclear Magnetic Resonance (NMR); • Single-cell analyses; • Single-molecule analyses; • Electrochemically modulated liquid chromatography; • Surface-enhanced Raman scattering. • *Mass spectrometer techniques and instrument design*	Three of the world's top solid state NMR experts reside in Ames Laboratory and a fourth will joining soon. Pioneering work in fundamentals of cellular physiology; disease diagnosis, treatment; Dr. E. Yeung has won 3 R&D 100 Awards – his Multiplexed Capillary Electrophoresis DNA Sequencer is licensed and in production for deciphering genetic codes and disease diagnoses and his Microfluor Detection device is used in analyzing and sequencing DNA Record of internationally recognized excellence: inductively-coupled plasma – mass spectrometer (ICP-MS) in every analytical lab in world; biomolecule analysis; senior chemist Robert S. "Sam" Houk was recently (2007) named a Fellow of the Society for Applied Spectroscopy for "service to the Society and exceptional contributions to spectroscopy."	Provide the Resource Foundations that Enable Great Science BES's Grand Challenges (see list in cell, above) Development of techniques for characterization of novel materials and rapid, sensitive detection of chemicals and biomaterials for applications ranging from bioremediation to national security. Development of new simulation and modeling techniques for use in energy and security decision modeling and design of materials.

The Future/Major Activities

SUMMARY

These are exciting times for science. For the first time in history, human design and control of quantum objects and processes are reachable goals. Photonics promises manipulation of photons and the development of technologies surpassing those of the maturing microelectronics age. Ultrafast science promises new insights and control of dynamical processes and reactions at the quantum level; while new instruments and powerful computational advances are taming the complexity encountered in correlated electron systems, emergent phenomena, and in nano-scale mechanical, photonic, and electronic interactions. This is also the era when biology and materials science are merging, with the promise of not just understanding and mimicking bio-processes, but of controlling them at the molecular level to obtain new, low cost and energy efficient routes to materials manufacturing, as well as energy harvesting and storage.

The Ames Laboratory is a premier research facility focusing primarily upon the design and invention of novel materials to meet these new challenges. It has the fundamental scientific and computational tools to propose new compositions, structures and methods of processing to tailor materials properties for particular uses and functions; it can then make these materials in laboratory-scale quantities; and it can measure and test their properties with the highest sophistication. Ames has particular expertise in the areas of catalysts, magnetic materials and photonic materials, all of which can be used in a variety of applications that generate, store or utilize energy cleanly and efficiently; or that store, manipulate or transmit information on quantum-mechanical scales. The Laboratory links basic and applied science to solve challenges across the scientific spectrum, and invent novel materials that enable new technologies.

In the coming years, Ames Laboratory will develop new distinguishing capabilities that enhance its programs, and extend its materials synthesis and preparation efforts into the areas of biologically inspired materials design and processing, accessing the tools that nature uses to fabricate inorganic materials that exhibit precise reproducibility and exquisite adaptation to purpose, without the need for high-energy processing. The Laboratory will also enhance its ability to measure the properties of materials on the atomic scale, using solid-state nuclear magnetic resonance. Already a clear leader in the use of NMR for the study of materials, the Laboratory will become a world-leading developer of new NMR capabilities that enable studies of atoms and the bonds between them, under extreme conditions and far away from equilibrium. This novel instrumentation will facilitate other work in the Laboratory, including the development of nano-designed catalysts for the efficient production of biofuels.

Infrastructure/The Ten Year Site Plan

Overview of Site Facilities and Infrastructure

The Ames Laboratory is a government-owned, contractor-operated facility located on the campus of and operated by Iowa State University (ISU) in Ames, Iowa. Ames is located in central Iowa approximately 35 miles north of Des Moines. The Laboratory is situated on approximately 10 acres of state-owned land on the ISU campus under a long-term, no cost lease. The lease line can be adjusted to accommodate new Laboratory facilities in the future. There is no federal owned real estate at the site (See Ames Laboratory Land Use Plan, Plan 46300.008). The real property assets include 12 buildings that total 327,664 gross square feet. The three laboratory buildings represent over 70% of the area and have an average age of 54 years; one 13 year old office building represents less than 15% of the area, and the other eight buildings are smaller shop and storage buildings that provide support functions. The buildings have been well maintained over their lifetimes and are currently in good condition as indicated by an Asset Condition Index (ACI) of 0.975. However, because the research buildings were designed and built for the research needs and activities of the 1950's, they are limited in providing effective and efficient infrastructure support for current and future research activities. The buildings are highly utilized with an Asset Utilization Index (AUI) of 0.982. Staffing at the end of FY2007 was over 600 full and part time staff representing 306 Full Time Equivalents (FTE). In addition there are also 200 associates who perform research in Ames Laboratory facilities. Two other real property assets are defined in the Facility Information Management System (FIMS), an electrical switch pit and a parking lot. Being located on the University campus allows the Laboratory to take full advantage of the infrastructure services provided by ISU, such as steam, chilled water, water and sewage service, compressed air, grounds maintenance, telecommunication systems, and roads without the need for Federal investment to construct, maintain, or recapitalize. The availability of these services allows the Laboratory to focus on maintaining and operating its research and support buildings. The relationship with ISU also enables the Laboratory to use space in University–owned buildings through a space usage agreement without investing in permanent space or long-term leases; currently Ames utilizes approximately 6,000 net usable square feet (nusf) in University buildings. No real estate actions are planned for FY2009 or FY2010.

SC Infrastructure Data Summary

Replacement Plant Value ($M)		62.1
Total Deferred Maintenance ($M)		1.5
Asset Condition Index	Mission Critical	0.98
	Mission Dependent	0.96
	Non-Mission Dependent	N/A
Asset Utilization Index	Office	0.995
	Warehouse	1.000
	Laboratory	0.974
	Housing	N/A
Prior Year Maintenance ($M)		1.01

Facilities and Infrastructure to Support Missions

Ames Laboratory is dedicated to providing facilities and infrastructure that will effectively enable and support its mission. Ames also strives to be an effective steward of the DOE assets entrusted to it by managing them with a long-term view which is quality driven, looks at the life cycle of the assets, utilizes

best industry practice, and is commensurate with the value and mission impact of the asset. This management links real property asset planning, programming, budgeting, and evaluation to program mission projections and performance outcomes. Resources are directed to facilities and infrastructure in the context of the overall needs and operation of the Laboratory to carry out its mission.

Because a philosophy of good stewardship has been a part of the heritage of the Ames Laboratory the overall condition of the buildings is excellent even though they are old. The excellent condition, however, does not equate to modern, mission-relevant facilities. This is particularly true of the research buildings. They are 47 to 59 years old and were designed for the research activities of the 1950's. Current research instruments and paradigms have very different infrastructure needs. This is particularly true of the Metals Development Building which was built to house pilot plant materials operations. As the building has been modified over its lifetime, it has become increasingly dysfunctional for modern research. It does not provide the modern, highly productive working environment and the functionality needed to support the materials discovery, design and synthesis efforts and to attract world class scientists.

The Office of Science has embarked on an ambitious initiative to modernize the facilities and infrastructure at its ten national laboratories. The goal is that all of the SC laboratories will be operating thoroughly modernized complexes by the end of the ten-year period (FY2009-FY2018). Modernized facilities will encompass the following characteristics:

- Safe, Secure, and Environmentally Sound Infrastructure
- A Highly Productive Working Environment
- Efficient Operations and Maintenance

Ames Laboratory has developed a strategy to achieve this goal in this time period. The table below provides a summary of the condition of the facilities from a mission readiness point of view, now and into the future. In accordance with the definitions from the Mission Readiness Model, the research buildings are considered Marginal, meaning deficiencies require major resources (work arounds) to ensure achievement of mission and that investments, to return to mission ready, require capital investments in excess of the GPP limit. For example, the current generation of instruments, such as electron microscopes, has increasingly sensitive infrastructure requirements for vibration, noise, temperature control, dust, power quality and electromagnetic interference to perform to their full potential. Adequate space for these sensitive instruments is not available without extensive modifications and, even then, the use of marginal space compromises the ability to achieve optimal results.

The cornerstone of this strategy is the replacement of the Metals Development Building under the Infrastructure Modernization Initiative. A state of the art facility will provide space for more exacting research efforts. The other existing research buildings will be able to house the research activities that have less stringent requirements. Other funds such as GPP, ESPC, overhead, and energy savings will be focused on the other research buildings. In this way the infrastructure for both of the research business lines will be upgraded from Marginal to Capable.

Facilities and Infrastructure to Support Laboratory Business Lines

Business Line	Facilities and Infrastructure	Summary Condition Evaluation	Planned Investments
Fundamental Materials Research	Spedding Hall Wilhelm Hall Metals Dev.	Marginal Mission Readiness The three research buildings are in good shape but are old and do not provide the modern infrastructure to serve current research paradigms. Good space for increasingly sensitive instruments, such as electron microscopes, is not available due to vibration, noise, or electromagnetic interference. Research using some new materials such as nano-scale particulates is limited by existing ventilations systems. Such installations require extensive modifications and work-arounds to provide space for those operations. The computation facilities are adequate for the immediate future but expansion will need to be addressed within the planning period. In particular, the Metals Development Building was built for pilot plant materials operations and does not provide the modern work environment and functionality needed to support the materials discovery, design and synthesis efforts.	Metals Development Building replacement (SLI Infrastructure Modernization Initiative) starting in FY2011 Spedding Hall HVAC Upgrade Project (GPP) in process. Access Control System Upgrade (GPP) sitewide beginning in FY2010. Lighting upgrade, Spedding fume hood stack upgrade, and Spedding window replacement through an ESPC. Systematic Space Modernization and Miscellaneous Small projects (GPP) beginning in FY2014 ESPC savings will be directed to further energy conservation and modernization efforts.
Analytical Techniques and Instrument Development	Spedding Hall Wilhelm Hall Metals Dev.	Marginal Mission Readiness The three research buildings are in good shape but are old and do not provide the modern infrastructure to serve current research paradigms. Good space for increasingly sensitive instruments, such as electron microscopes, is not available due to vibration, noise, or electromagnetic interference. Research using some new materials such as nano-scale particulates is limited by existing ventilations systems. Such installations require extensive modifications and work-arounds to provide space for those operations. The computation facilities are adequate for the immediate future but expansion will need to be addressed within the planning period. In particular, the Metals Development Building was built for pilot plant materials operations and does not provide the modern work environment and functionality needed to support the materials discovery, design and synthesis efforts.	Metals Development Building replacement (SLI Infrastructure Modernization Initiative) starting in FY2011 Spedding Hall HVAC Upgrade Project (GPP) in process. Access Control System Upgrade (GPP) sitewide beginning in FY2010. Lighting upgrade, Spedding fume hood stack upgrade, and Spedding window replacement through an ESPC. Systematic Space Modernization and Miscellaneous Small projects (GPP) beginning in FY2014 ESPC savings will be directed to further energy conservation and modernization efforts.
Sitewide Laboratory Operations	TASF Support Buildings Other Structures and Facilities (OSF's)	Capable Administrative space (TASF) is in excellent condition and will provide excellent functional capability for administrative needs over the life of this plan. Recent remodeling has improved the effective utilization of space for mission support activities by remodeling underutilized space into modern training and graphic design functions. The building was built using the energy conservation and sustainability practices	Site wide lighting upgrade through an ESPC. Access Control System Upgrade (GPP) starting in FY2010. Record Storage Area, Campus Warehouse (GPP) starting in FY2011.

		that are now out of date. While this does not affect mission support capabilities, there are opportunities for energy conservation that would reduce operating costs and allow resources to be redirected to other modernization or research activities. Support buildings and OSF's have no deficiencies that impact delivery of mission support. Except for the need for additional record storage space, the capability and capacity is sufficient for the needs anticipated for the duration of this plan. Major utility generation (steam and chilled water), utility distribution and site infrastructure such as roads are provided by the contractor as part of their services to the entire ISU campus. They are responsible for the capital investment and maintenance. The capacity of these services is adequate for current needs and anticipated future demand.	

Note: "Marginal Mission Readiness" means deficiencies require major resources (work arounds) to ensure achievement of mission; investments to return to mission ready require capital investments in excess of the IGPP limit.
"Capable" means there are no deficiencies that impact delivery of mission; operable without work arounds; operating parameters meet current and known future demand.

Strategic Site Investments

As mentioned in the previous section, Ames has developed a modernization strategy that will result in infrastructure that is fully mission ready, will enhance research efforts, contribute to sustainability goals and meet the Office of Science modernization goals. The strategy includes capital investment through ESPC funding, building replacement, capital improvements to the remaining research buildings and continuing effective maintenance to extend the useful life of the buildings. The initiative utilizes line item funding in the Infrastructure Modernization Initiative, ESPC, GPP and overhead funding, including funds from energy savings.

Replacement of the Metals Development Building is crucial to meeting the infrastructure goals. The $46M project will build a new 66,500 square foot building with funding slated to begin in FY2011. Upon completion, the critical and sensitive research activities from the existing research buildings will be moved into the new building. Any remaining activities in the Metals Development Building will then be relocated into the space vacated in the other buildings and the Metals Development Building will be demolished. The new building will provide specialized space for current and anticipated state-of-the-art instrumentation such as high resolution transmission electron microscopes and scanning probe microscopes, which in turn will dramatically improve the resolution and stability of these instruments and the range of measurements that they can accomplish. It will have the capability to efficiently deal with the more stringent ventilation requirements of working with new and advanced materials that may be more toxic or reactive. A building with flexibility designed into it will allow space to be reconfigured quickly and efficiently when there are changes in research activities and technologies. A building design that uses space more efficiently will allow the area of the building will be reduced approximately 5%. It is anticipated that Ames would be able to reduce the amount of space rented from ISU. The new building will provide a preferred work environment that will help attract and retain high quality staff. It will also contribute to increasing staff productivity and enhancing the collaboration and teaming that characterizes research at Ames. The project will eliminate 1/3 of the total deferred maintenance at the site. The

building will be designed to achieve LEED Gold Certification. The focused application of current technology and design will achieve energy savings that would not be possible within the existing building. References indicate Gold Certification typically results in energy savings of 50% to 60%. This will represent a savings of up to 15% of the total energy use of the site. The savings can be redirected into other energy conservation or modernization efforts in other buildings.

Ames is pursing third party financing of energy conservation upgrades through an Energy Savings Performance Contract (ESPC). The Preliminary Site Survey has been completed, the Initial Proposal has been reviewed and approved, and the Energy Saving Contactor is beginning the Detailed Energy Survey. A funding investment of $1.4M is planned for Energy Conservation Measures (ECM) across the site. The measures are estimated to generate approximately $200,000 annual savings. The investment will be paid off over a contract term of 11 years. The ECM's include lighting upgrades that will improve the lighting efficiency throughout the site. Windows will be replaced and fume hood vent stacks leaks will be sealed in Spedding Hall. A water conservation ECM will replace existing restroom fixtures with low flow units. Once the contract term is completed, the cost savings can be redirected into further modernization efforts. The estimated savings will reduce Ames energy consumption 18% and reduce the water consumption 14%.

GPP funding will focus on the remaining research buildings. A heating, ventilating, & air conditioning (HVAC) upgrade project in Spedding Hall is currently in progress. This project will upgrade the existing systems of heating, ventilating and air conditioning (HVAC) and makeup air controls in Spedding Hall to improve the safety, reliability, energy efficiency and flexibility of the systems. The system has been in service for nearly 50 years and cannot provide the level of control, air balance, reliability and safety monitoring that is beneficial for laboratory activities. The HVAC system will be upgraded for variable air volume operation which will provide temperature control in each space independently. Because of the size of the project, it is being phased over four years, out to FY2010, because it exceeds the annual GPP funding received.

Once the Spedding HVAC project is completed, the next major GPP project is planned to be the Upgrade Access Control System in FY2010. The project will upgrade the access control systems of the Laboratory to current technology. The existing system includes a mix of standard key and pin type "yale" cylinder locks and a fifteen-year old access control system based on a PC with a DOS operating system. The new system will provide an electronic access control system throughout the facility that will utilize current technology, preferably, with proximity sensing. This project will have to be phased over three years.

GPP funding is planned for Upgrade Electrical Distribution System, Spedding Hall in FY2012 and FY2013. Starting in FY2014, plans call for GPP funding to be directed to Systematic Space Modernization in the research buildings. The complete list of the GPP funding plan is shown in the attached Integrated Facilities and Infrastructure (IFI) Budget Crosscut.

The maintenance program consists of maintenance and repair activities necessary to keep the existing inventory of facilities in good working order and extend their service lives. It includes regularly scheduled maintenance, corrective repairs, and periodic replacement of components over the service life of the facility as well as the facility management, engineering, documentation, and oversight required to carry out these functions. Historically, the facilities have been well maintained so that the service lives of the buildings have been extended. Historical data shows that the Laboratory has been able to control and slightly reduce deferred maintenance levels with modest levels of indirect funded maintenance, allowing Ames to operate with a 1.8% target Maintenance Investment Index. Historical experience shows that the current levels of expenditures have been adequate to maintain the facilities. Therefore, future maintenance funding levels are projected by escalating the maintenance budget to continue this level of effort.

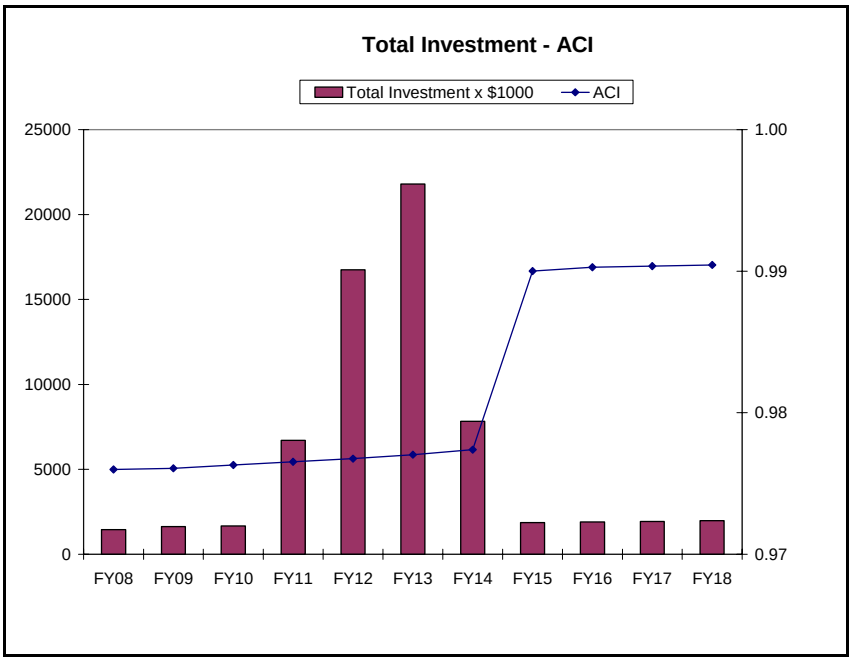
There are no excess facilities at Ames Laboratory and none planned.

Trends and Metrics

Performance measures are utilized to link facility and infrastructure performance to outputs and outcomes. Broad-based measures are used so a small number of results can provide a high level, integrated grasp of the stewardship of DOE assets at the Ames Laboratory. The DOE corporate wide measures specific to RPAM, the Asset Condition Index and the Asset Utilization Index are reported directly through FIMS as well as being incorporated in the Laboratory Self-Assessment. Ames continues to perform well (DOE rated F&I an "A-" in FY2007) with most of the measures showing slight improvement. The one exception has been the energy use per square foot. The addition of a data center and the associated electrical consumption has overwhelmed the recent energy conservation efforts. It is expected however that operational changes recommended by the FEMP Energy Efficiency Expert Evaluations (E4) and completion of the ESPC project will put the savings ahead of target. The replacement of the Metals Development Building will enable Ames to meet or exceed the 30% reduction goal set forth in the TEAM initiative.

Facilities and Infrastructure Investments ($M) – Impact to Asset Condition Index

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Maintenance	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.4
DMR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excess Facility Disposition	-	-	-	-	-	-	-	-	-	-	-
GPP	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Line Items	-	-	-	5.0	15.0	20.0	6.0	-	-	-	-
Total Investment	1.4	1.6	1.7	6.7	16.8	21.8	7.8	1.9	1.9	1.9	2.0
Estimated RPV	62.1	63.5	65.0	66.5	68.0	69.6	71.2	98.7	101.0	103.3	105.6
Estimated DM	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.0	1.0	1.0	1.0
Site-wide ACI	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.99	0.99	0.99	0.99



Sustainability

The infrastructure plans provide major improvements in the area of sustainability and energy conservation in accordance with Executive Order 13423 and DOE Order O430.2B. The two key components are the ESPC project and the replacement of the Metals Development Building. If these proceed as planned, Ames will be able to meet the 30% energy reduction target. DOE Order O 430.2B was recently approved and provides requirements and responsibilities for managing DOE energy, buildings and fleets. A key requirement of the order is an Executable Plan that commits Ames to a detailed set of actions designed to meet sustainment goals and is due to DOE by September 30, 2008. These are summarized in the following table.

DOE Order 430.2B Goals

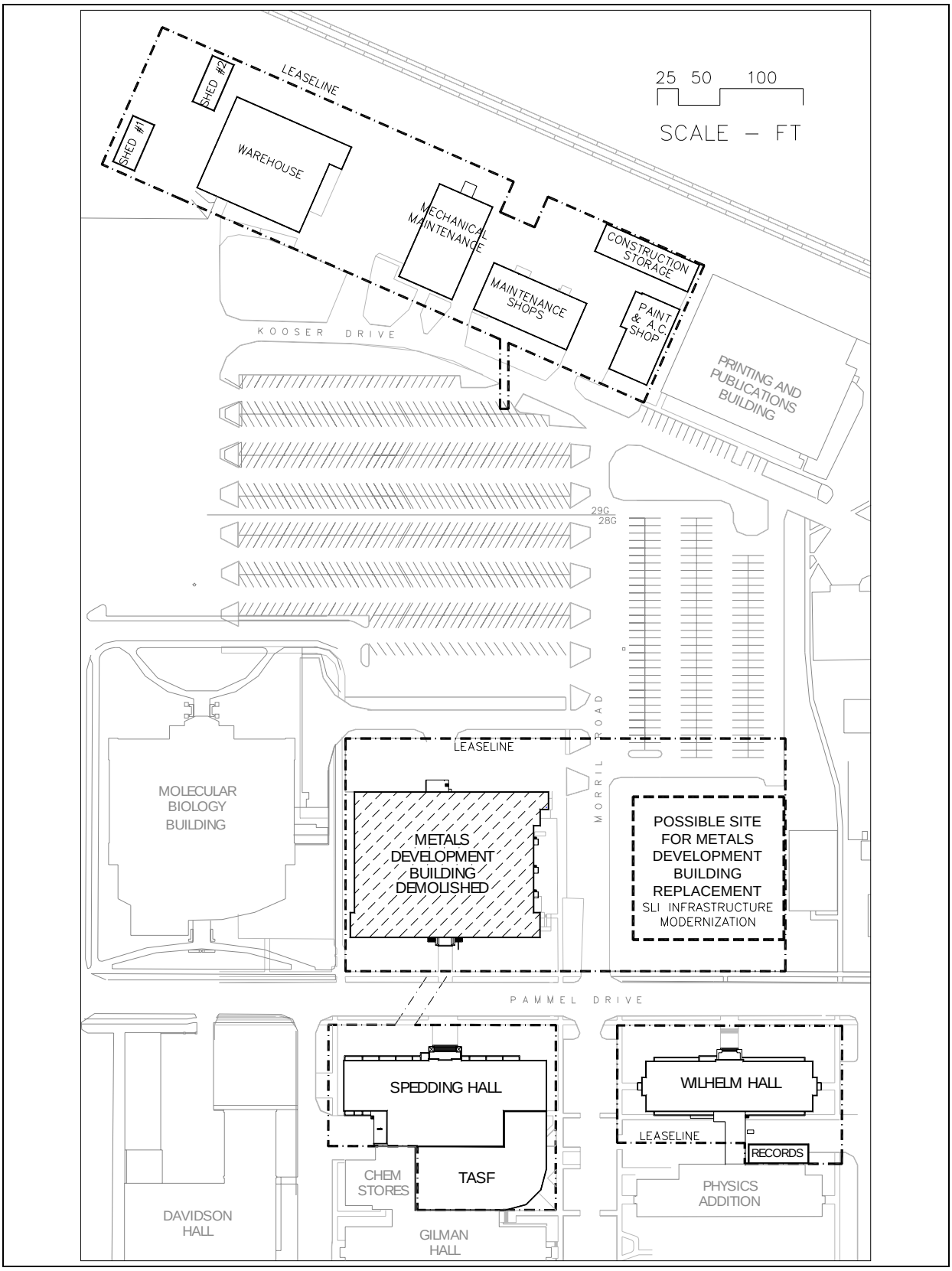
Requirement	Goal	Funding Source	Cost	Milestone	Progress to Date
Energy Reduction of 30%	18%	ESPC	$1.4 M	FY2009	IP has been reviewed and approved. Detailed Energy Survey is in progress.
	15%	SLI Infrastructure Moderniza-tion	$46M	FY2015	Replacement of the Metals Development Building with new facility is slated for funding in FY2011. CD0 documents are being prepared for submission.
Renewable Energy On-site	0%	ESPC	NA	FY2009	The Preliminary Survey performed by the ESCO looked at on-site renewable energy opportunities. A rooftop photovoltaic installation was evaluated but was not economically viable due to limited capacity and a simple payback of 89 years. Because on-site renewable energy is not feasible, a waver will be requested.
Renewable Energy Off-Site	4%	Overhead	$2.5K	FY2008	Renewable Energy Certificates (REC) for electrical power are available at a reasonable premium. Ames Laboratory anticipates that 4% of electricity purchased will be from a renewable energy source through REC's.

Water Reduction	14%	ESPC	$0.56M	FY2009	IP has been reviewed and approved. Detailed Energy Survey is in progress.
	TBD	SLI Infrastructure Moderniza-tion	$46M	FY2015	Replacement of the Metals Development Building with new facility is slated for funding in FY2011. CD0 documents are being prepared for submission.
Sustainment	15% of space	TBD	TBD	FY2015	Guidance on the process and protocol for performing this assessment on existing space is currently being developed.

Infrastructure Summary

Ames Laboratory has been a good steward of the government assets and resources by maintaining the facilities and infrastructure in excellent condition. Ames remains committed to directing the resources necessary to continue this philosophy. Since all of the research buildings are old, Ames has no research facilities built with the modern design methods and technologies targeted to serve the current research paradigm. This plan lays out a broad strategy for achieving the facilities and infrastructure goals laid out by executive order, DOE orders, Office of Science and best management practices. The plan uses a wide range of resources to accomplish this effort through line item financing, GPP, ESPC third party financing, overhead, and savings from improved efficiencies. The result of this plan will be infrastructure that enables the research efforts rather than limiting them.

Appendix 1. Ames Site Map



IFI Crosscut

See file: Ames IFI Crosscut April 21, 2008.pdf