



May 19, 2008

Debbie Davenport
Auditor General
Office of the Auditor General
2910 North 44th Street, Suite 410
Phoenix, AZ 85018

Dear Ms. Davenport:

On behalf of Arizona State University (ASU), I am pleased to respond to the performance audit on the Technology Transfer Program at ASU. We are in agreement with all of your recommendations. Our responses to your recommendations are enclosed. The report represents a thoughtful analysis of the ASU Technology Transfer Program.

My staff and I wish to thank you and your staff for the professional manner in which this audit was performed. We are constantly looking for ways to improve our programs and operations. The implementation of your recommendations will further improve the Technology Transfer Program at ASU.

Sincerely,

Michael M. Crow
President

MMC:dq
/c

Enclosure

c: Rick Shangraw, Vice President for Research & Economic Affairs
Carol Campbell, Executive Vice President and CFO

**Response from Arizona State University to the
Auditor General Report on Technology Transfer**

GENERAL

We have reviewed the report regarding university technology transfer programs issued by the Auditor General on May 12, 2008 ("Report"). This letter sets forth our written response to the Report as it pertains to Arizona State University (ASU). We have some general observations regarding the Report, as well as specific responses to the recommendations set forth therein. Additionally, we have included a summary table of the findings, recommendations, responses, metrics and timeline, which can be used by ASU and the Arizona Auditor General to monitor ASU's compliance in the coming months.

The primary mission of Arizona Technology Enterprises (AzTE) is focused on providing core services to ASU's faculty and research enterprise in the following areas: (i) identification and development of intellectual property, (ii) evaluation of invention disclosures from a legal and commercial perspective, (iii) patent protection of inventions, where appropriate, (iv) marketing and licensing activities, and (v) industry-university relations.

The Report appears to draw the conclusion that outreach to ASU's faculty and researchers may have diminished due to recent organizational transition and multiple vacancies. While AzTE has indeed undergone recent organizational changes, it is on track to receiving approximately the same number of invention disclosures as submitted by ASU researchers in fiscal year 2007.

As noted in the Report, AzTE has now filled its staff vacancies. New members of the current team have extensive industry and university experience in the area of technology evaluation and licensing. In addition, AzTE's endeavors in seeking private equity funding have been enhanced by recent hires whose industry contacts and networks have already brought in several venture capital firms to review ASU research and technologies for potential investment.

Current management at AzTE is also placing a much greater emphasis on supporting faculty in terms of industry-sponsored research. AzTE is presently working with ASU's Office of the Vice President for Research and Economic Affairs on streamlining the process for reviewing sponsored research agreements and addressing industry concerns in funding research at ASU. In addition, where requested by ASU, AzTE has played a much greater role than in the past with respect to negotiating research contracts with companies. During fiscal year 2008, for instance, the organization was instrumental in securing approximately \$8.5 million in corporate research funding for ASU (which also resulted in a matching grant of \$2.2 million from Science Foundation Arizona).

FINDING 1

1. *To increase the level of support researchers receive from their departments, ASU should encourage AzTE to reinstitute the practice of providing quarterly reports to deans and department chairs of research-intensive units to keep them abreast of their units' technology transfer activity.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

To keep research-intensive units abreast of technology transfer activity, ASU and AzTE will develop a list of deans, department chairs, and center directors who will receive a quarterly report of invention disclosure activity at ASU.

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2. *To encourage more faculty participation in technology transfer, ASU should:*
 - a. *Encourage its research-intensive departments to consider adding participation in technology transfer into their professional evaluation guidelines for faculty promotion and tenure.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

ASU's Office of the Vice President for Research and Economic Affairs will work with the Executive Vice President and University Provost to encourage departments to consider this guideline recommendation.

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- b. *Continue to promote faculty participation in technology transfer by hosting annual recognition ceremonies and awarding university inventors who excel in this process.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

In FY2005, FY2006 and FY2007, AzTE recognized all university inventors by hosting an annual recognition ceremony. In FY2006 and FY2007, AzTE awarded a few university inventors that excelled in the technology transfer process at the ceremony. In FY2008, rather than host a ceremony and award only a few selected inventors, AzTE is awarding all university inventors with a framed copy of his/her issued United States patent. To date, approximately 139 copies of issued United States patents have been framed and are in process of being delivered. AzTE will continue to provide a framed copy of each issued United States patent to university inventors.

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3. *To better educate faculty and increase their exposure to the technology transfer process, ASU should:*
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- a. *Identify the departments known for producing commercially viable research and encourage AzTE to conduct workshops for department faculty.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

AzTE regularly conducts workshops on the technology transfer process for department faculty. ASU will work with AzTE to identify, to the extent possible, those departments known for producing commercially viable research, and AzTE will conduct workshops for the faculty in such departments.

- b. *Encourage research-intensive departments to invite AzTE staff to their meetings on an annual basis.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

AzTE has attended department meetings in the past and will continue to work with research-intensive departments to attend their meetings on an annual basis. ASU will support such departments with respect to these activities.

- c. *Proactively identify new university researchers in disciplines with high commercial potential and notify AzTE of their hiring so that AzTE can make initial contact.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

AzTE has provided materials on the technology transfer process and participated in new faculty orientation for the past three years. ASU will work with AzTE to identify, to the extent possible, those newly-hired university researchers in disciplines with high commercial potential for purposes of introducing such researchers to the technology transfer process. Despite staffing turnover over the past year, AzTE believes that it will receive approximately the same number of disclosures during fiscal year 2008 as it did in fiscal year 2007.

- d. *Require AzTE to develop a mechanism for informing university inventors of the university's technology transfer process. One possibility may be in the form of a technology transfer reference pamphlet, CD, or DVD to be distributed to new employees and those inventors conducting research in areas of high commercial potential. Among other things, AzTE should include information about the services that it offers, what is expected of the researcher, intellectual property legal matters, and contact information, and should direct university researchers to AzTE's Web site for further information when required.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Over the past three years, through presentations and meetings, AzTE has provided new faculty with information on the technology transfer process, which has included information about the services that it offers, intellectual property legal matters, and contact information. Over the course of the next several months, AzTE will be developing internal materials containing such information for distribution to the faculty. In addition, AzTE is in the process of significantly improving its website, which will include all of the information listed above. The website will also include an online survey for inventors to provide anonymous feedback and a secure portal for inventors to track the progress of patent applications. ASU will require AzTE to continue to enhance the information it provides to faculty on the technology transfer process and the services it offers.

FINDING 2

1. *ASU should ensure that AzTE fully rebuilds and strengthens its marketing program in accordance with recommended practices.*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Historically, AzTE has utilized a mix of marketing activities to promote ASU inventions to prospective licensees. This included digital media, conferences, industry trade shows, and direct solicitation to identified key prospects. Current management intends to continue these activities. In addition, AzTE is in the process of launching a new improved website which will allow potential licensees and investors to search its portfolio of ASU inventions. AzTE's new website will also showcase select discoveries through affiliate relationships such as Kauffman Foundation's iBridge network, which is an organization that exclusively markets university technologies to industry. While AzTE has used the Technology Ventures Clinic, an internship program, for marketing research, AzTE will evaluate if its marketing research efforts should employ the use of graduate students rather than interns. ASU will require AzTE to continue to explore and implement, as appropriate, new marketing activities.

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2. *As part of its review of sponsored research practices, ASU should take steps to improve its technology transfer-related negotiations with industry by:*

- a. *Working with industry to identify their concerns and needs regarding technology transfer and to determine how they can more effectively work together;*

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

In collaboration with AzTE, ASU's Office of the Vice President for Research and Economic Affairs has been working with certain companies to determine how it can more effectively work with them on research projects and collaborations given various policy and legal constraints. AzTE and ASU have identified industry concerns and needs regarding technology transfer, and are in the process of negotiating "master agreements" with certain companies to facilitate future sponsored research.

ASU and AzTE are presently in discussions with certain companies to develop a master research agreement with pre-negotiated terms for future funding arrangements. Once a master research agreement is signed with an industry partner, covered projects will be appended to such agreement without further negotiation.

b. Developing specific technology transfer goals related to industry collaboration efforts; and

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

With the support and assistance of AzTE, ASU is working to develop specific technology transfer goals that will promote and advance collaborations with industry. In addition, ASU's Office of the Vice President for Research and Economic Affairs has recently created a new dedicated position, Associate Vice President for Corporate Engagement, who is responsible for establishing, building, maintaining and improving university-industry relations.

c. Determining how its negotiation process can be improved to meet the goals and evaluating its progress by identifying and collecting data on relevant performance measures.

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

As noted earlier, ASU's Office of the Vice President for Research and Economic Affairs is working with AzTE to streamline the process for reviewing sponsored research agreements and to address industry concerns in funding university research. In addition, ASU is in the process of negotiating master agreements with certain companies interested in funding research at the university.

FINDING 3

1. To ensure that the university fully implements conflict of interest management plans, ASU's Research Compliance Office should perform follow-up monitoring of conflict management plans annually and as needed. Specifically, plans should be monitored when the inventor reports plan changes, university officials refer a plan for monitoring, and the Compliance Office selects the plan for quarterly random audits.

RESPONSE: The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The Research Compliance Office, within ASU's Office of the Vice President for Research and Economic Affairs, has implemented a plan to monitor conflict of interest

management plans annually and as needed after approval. In addition, plans will be monitored when the investigator reports a change, when another university partner refers a plan for monitoring or when a plan is selected for random audit.

Arizona State University
Technology Transfer Performance Audit Table of Findings, Recommendations and Responses

FINDING 1: Although performance varies, universities can take steps to increase commercially viable invention disclosures				
	Recommendation	Response	Metric	Timeline/Status
1	<i>To increase the level of support researchers receive from their departments, ASU should encourage AzTE to reinstitute the practice of providing quarterly reports to deans and department chairs of research-intensive units to keep them abreast of their units' technology transfer activity.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	AzTE provides quarterly reports to deans and department chairs of research-intensive units.	FY 2009
2	<i>To encourage more faculty participation in technology transfer, ASU should:</i>			
a	<i>Encourage its research-intensive departments to consider adding participation in technology transfer into their professional evaluation guidelines for faculty promotion and tenure</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	ASU's Office of the Vice President for Research and Economic Affairs will work with the Executive Vice President and University Provost to encourage departments to consider this guideline recommendation.	FY 2009
b	<i>Continue to promote faculty participation in technology transfer by hosting annual recognition ceremonies and awarding university inventors who excel in this process.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	AzTE and ASU will host an annual recognition ceremony and award inventors who excel in the process. AzTE recognizes inventors by providing each inventor with a framed copy of his/her issued US patent.	FY 2009
3	<i>To better educate faculty and increase their exposure to the technology transfer process, ASU should:</i>			
a	<i>Identify the departments known for producing commercially viable research and encourage AzTE to conduct workshops for department faculty.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	ASU will work with AzTE to identify, to the extent possible, those departments known for producing commercially viable research. AzTE conducts workshops for the faculty in such departments.	FY 2009
b	<i>Encourage research-intensive departments to invite AzTE staff to their meetings on an annual basis.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	On an annual basis, AzTE attends meetings of research-intensive departments.	FY 2009

**Arizona State University
Technology Transfer Performance Audit Table of Findings, Recommendations and Responses**

c	<i>Proactively identify new university researchers in disciplines with high commercial potential and notify AzTE of their hiring so that AzTE can make initial contact.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	ASU will work with AzTE to identify, to the extent possible, newly-hired university researchers in disciplines with high commercial potential. AzTE will contact such researchers and introduce them to the technology transfer process.	FY 2009
d	<i>Require AzTE to develop a mechanism for informing university inventors of the university's technology transfer process. One possibility may be in the form of a technology transfer reference pamphlet, CD, or DVD to be distributed to new employees and those inventors conducting research in areas of high commercial potential. Among other things, AzTE should include information about the services that it offers, what is expected of the researcher, intellectual property legal matters, and contact information, and should direct university researchers to AzTE's Web site for further information when required.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	AzTE will develop internal materials containing such information for distribution to the faculty. AzTE's website includes the recommended information, an online survey for inventors to provide anonymous feedback and a secure portal for inventors to track the progress of patent applications. AzTE continues to enhance the information it provides to faculty on the technology transfer process and the services it offers.	FY 2009

FINDING 2: All three universities – particularly UA – should improve aspects of marketing and all three should review their negotiation practices

	Recommendation	Response	Metric	Timeline/Status
1	<i>ASU should ensure that AzTE fully rebuilds and strengthens its marketing program in accordance with recommended practices.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	Prior to marketing, AzTE evaluates the technology and conducts market research on the technology. AzTE uses digital media, conferences, industry trade shows, and direct solicitation to identified key prospects. AzTE's website (i) allows potential licensees and investors to search its portfolio of ASU inventions and (ii) showcases select discoveries through affiliate relationships.	FY 2009
2	<i>As part of its review of sponsored research practices, ASU should take steps to improve its technology transfer-related negotiations with industry by:</i>			

**Arizona State University
Technology Transfer Performance Audit Table of Findings, Recommendations and Responses**

a	<i>Working with industry to identify their concerns and needs regarding technology transfer and to determine how they can more effectively work together;</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	AzTE and ASU are working to determine how it can more effectively work with them on research projects and collaborations given various policy and legal constraints. AzTE and ASU are identifying industry concerns and needs regarding technology transfer. AzTE and ASU are negotiating “master agreements” with certain companies to facilitate future sponsored research.	FY 2009
b	<i>Developing specific technology transfer goals related to industry collaboration efforts; and</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	AzTE and ASU have specific technology transfer goals that promote and advance collaborations with industry.	FY 2009
c	<i>Determining how its negotiation process can be improved to meet the goals and evaluating its progress by identifying and collecting data on relevant performance measures.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	ASU monitors the time it takes to negotiate and execute a sponsored research agreement. ASU and AzTE have developed different approaches to sponsored research collaborations with industry based on the amount of funding, industry sector, and expected commercial value of the intellectual property. ASU has master agreements with certain companies interested in funding research at the university.	FY 2009

FINDING 3: All three universities – particularly UA and NAU – need to better manage conflicts of interest, and the Board should establish minimum standards

	Recommendation	Response	Metric	Timeline/Status
1	<i>To ensure that the university fully implements conflict of interest management plans, ASU’s Research Compliance Office should perform follow-up monitoring of conflict management plans annually and as needed. Specifically, plans should be monitored when the inventor reports plan changes, university officials refer a plan for monitoring, and the Compliance Office selects the plan for quarterly random audits.</i>	The finding of the Auditor General is agreed to and the audit recommendation will be implemented.	The Research Compliance Office has implemented a plan to monitor conflict of interest management plans annually and as needed after approval. Plans are monitored when the investigator reports a change, when another university partner refers a plan for monitoring or when a plan is selected for random audit.	FY 2009

May 19, 2008

Debra K. Davenport, CPA
Auditor General
Office of the Auditor General
2910 North 44th Street, Suite 410
Phoenix, Arizona 85018

Re: The University of Arizona – Technology Transfer Programs

Dear Ms. Davenport:

Please find enclosed written comments from The University of Arizona in response to relevant sections of the revised preliminary report draft on technology transfer programs at the three state universities.

Our comments include important contextual information as well as formal responses to each recommendation, as required. For each recommendation, the finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Best regards,

Robert N. Shelton
President

RNS/acc
Enclosures

c: Dr. Leslie P. Tolbert, Vice President for Research, Graduate Studies
and Economic Development



University of Arizona Response to the State of Arizona Office of the Auditor General Report: Performance Audit of Technology Transfer

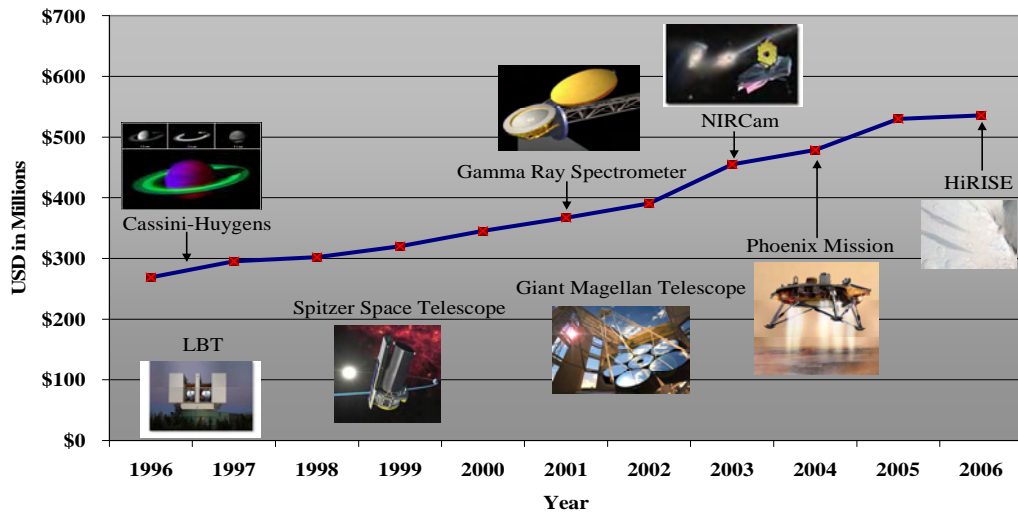
We thank the Auditor General and staff for their efforts to help develop a better understanding of the role of technology transfer within the broader knowledge-transfer activities of the State's public universities.

We agree that further success in increasing technology transfer from the University of Arizona is important, whether in the form of more disclosures from our faculty, greater revenue from licensing, or a greater number of Arizona companies working with the University. Technology transfer is a challenging topic, with many players and complex interactions, so a reader unfamiliar with the context of these audit conclusions might miss the successes of the University in its technology- and knowledge-transfer functions. We hope our comments enhance the Arizona public's understanding of this report and will remind us not only where we can improve, but also where we have done well.

The University of Arizona is the land grant university for Arizona, a top 20 public research institution and, through its medical school and hospitals, a premier provider of medical services to the State. UA takes pride in balancing its missions of education, research and service in its technology transfer endeavors, as it does in all its programs.

- **Land Grant Origins.** As the land grant university for Arizona, UA has a 117-year history of successfully transferring technology through formal courses, cooperative extension, and collaborative research. These are not monetized transfers, but the results are apparent in students we graduate, in all the counties of Arizona, and in our ever expanding research horizons, of which the new \$50 Million iPlant Collaborative is but one exciting example.
- **Success in Research, and Relation to Invention Disclosures.** It is tempting to assume that the number of disclosures should rise in proportion to research funding, and that licensing income should increase with the number of disclosures. But, while correlations are expected, the relationship among those metrics is not direct. For example, at UA disclosure counts have been approximately level, while research funding has grown, particularly in space sciences and astronomy -- areas where traditional licensed-based technology transfer is uncommon. The apparent decrease in disclosure rates per research dollar reflects UA's emergence as a premier space sciences university. We highlight some successes below to help illustrate that UA projects are "the science that enables Science".

**UA Total Research and Development Expenditures FY 1996-2006
With Major Space Science and Astronomy Projects**



- **Public Mission.** Formal technology transfer through intellectual property licensing is a relatively recent development but complements UA's long history as a land grant university. In particular, the UA balances focused technology transfer licensing and its broader knowledge transfer activities, seeking financial return from the use license of State assets while more generally enhancing the lives of Arizona citizens. Some highlights:
 - In licensing, although licensing income is important, the University focuses on a fair deal: disseminating knowledge for societal benefit is more important to the University and its faculty than closely holding knowledge in an attempt to maximize licensing income.
 - UA focuses on the long term in its licensing in order to build a stable, diversified revenue stream. With the well known lag between license execution and receipt of royalties from product sales, UA traces current modest license revenues to the institution's technology transfer history of the 1990s. Increased licensing is definitely the goal, and as home to Arizona's College of Agriculture and Life Sciences, we understand that an abundant harvest requires sowing an ample supply of seeds, and tending the crops as they grow and mature.
 - We have a preference for Arizona first.
 - Between FY 2001 and FY 2006, 20% of the 155 licenses and options done by the OTT supported Arizona's competitiveness.
 - 75% of all University of Arizona start-up companies in that period were located in Arizona. This year all of our start-ups are located within the State, thanks to partners such as Science Foundation Arizona.
 - Our Office of Technology Transfer (OTT) has developed an elegant mechanism to share in the financial growth of spin-outs without taking equity. We are confident that the number of UA start-ups contributing to Arizona's economic development will continue to grow, and that the return from some of them will contribute significantly in the long term to licensing revenues.
- **Marketing Early-stage Inventions.** The University acknowledges that personal contact in technology licensing and consistent documentation of processes are both desirable. In parallel, OTT's implementation of scalable, efficient marketing using the internet and e-commerce attempts to license more than the rare obvious winners, and to address the more common "middle ground" of disclosures. These technologies might well provide benefit to the public if we bring them to the attention of the market, although our experience suggests that they are often not sufficiently advanced to market through direct, personal contacts.
 - One good example is the solar-grade silicon example mentioned in the audit report introduction: a new AZ-based venture start-up is now well along in plans to commercialize an invention whose value presented initially as marginal.
- **A Leader in Industry-Sponsored Research.** The UA is keen to communicate to Arizona citizens our success in working with industry, as well as our desire to continuously improve our interactions with our private sector collaborators. Some highlights:
 - From FY 2001 to FY 2006, UA received an average of 12.5 % of its total externally-funded research *awards* from industry, as reported in our Research Profile publication. For comparison, that is only slightly behind the 13.5% figure for The Ohio State University, which is one of UA's peer institutions, and which the National Science Foundation ranked second nationally in receiving industry-sponsored research funding for FY 2006. In several years in the 2001-2006 period, UA actually received more industry awards than The Ohio State University.
 - From FY 2001 to FY 2006 UA's R&D *expenditures* from industry averaged 6.2% while its peer group averaged 4.7%; the national average of all universities in FY 2006 was 5.1%. It is

important to note that funds awarded to the UA but then transmitted to collaborators and partners are not counted in UA's research expenditures. For example, UA researchers provided an average of \$30 Million per year to subcontractors in and out of Arizona through their industry sponsored collaborations, and that amount does not appear in UA expenditures.

- UA has recently created and staffed a new position, Director of Corporate and Business Relations, to coordinate and improve our interactions with industry.
- **Conflict of Interest Policy and Process at UA.** The performance audit raises several issues regarding the identification and management of conflicts of interest at UA. Individual recommendations are addressed below. It is important to note that many of these issues have been under review at the UA for some time, and there has been significant progress made in drafting a new conflict of interest policy to address the auditors' points. That effort was temporarily placed on hold until the arrival of the new Assistant Vice President of Research Compliance and Policy, Elizabeth Boyd, PhD. Dr. Boyd arrived on March 10, 2008 with a decade of experience and an international reputation as an expert in conflicts of interest in university settings. Her first priority is to resume the policy revision process and to implement the changes promptly after the Faculty Senate adopts the revised policies.

Responses to Specific Recommendations

Finding 1: Although performance varies, universities can take steps to increase commercially viable invention disclosures.

1. To help ensure that the Office of Technology Transfer can interact with inventors as necessary, UA should evaluate whether its technology transfer program staffing levels are adequate and take steps to increase program resources as needed.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Steps have been taken and additional program resources will be made available beginning in FY 2009. These resources are: (i) additional budget for two licensing managers with one position being a joint position with Optical Sciences; and (ii) additional budget for information resources and direct marketing activities.

2. To increase the level of interaction between licensing officials and inventors, UA should encourage appropriate research departments to work with the Office to share the expenses of replicating the model used in the BIO5 Institute.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Resources have been made available beginning in FY 2009 to hire an individual to replicate the BIO5 model in Optical Sciences (see F1.1 above). Optical Sciences and BIO5 represent two major programs funded under the TRIF initiative at the University of Arizona.

3. To encourage more faculty participation in technology transfer, UA should:
 - a. Encourage its research-intensive departments to consider adding participation in technology transfer into their professional evaluation guidelines for faculty promotion and tenure.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The Office of the Vice President for Research will identify the most research-intensive departments by FY 2007 research expenditure. The Vice President for Research (VPR) will send a written memo to the Department Heads to encourage the Departments to consider adding participation in technology transfer into their professional evaluation guidelines for faculty promotion and tenure. In addition, the VPR will send a similar memo to the Chairs of the Faculty

Senate and the Committee of Eleven.

- b. Continue to promote faculty participation in technology transfer by hosting annual recognition ceremonies and awarding university inventors who excel in this process.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

UA's Innovation Day with its associated Technology Innovation Awards Luncheon has been a true success in promoting awareness, participation and recognition of faculty achievement in technology transfer. Building upon our five years of success, the University will continue UA Innovation Day and the Innovation Awards.

4. To better educate faculty and increase their exposure to the technology transfer process, UA should:

- a. Identify the departments known for producing commercially viable research and encourage the Office to conduct workshops for department faculty.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The OTT tracks new research awards as part of its outreach to identify promising faculty research and will continue to offer to conduct workshops, brown bag lunch meetings and one-on-one meetings to units.

- b. Encourage departments to invite Office of Technology Transfer staff to their meetings on an annual basis.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The VPR will send a written memo to the relevant units, encouraging them to take advantage of the outreach offered and to work with the OTT to explore models of technology transfer suited to their needs (see F1.3.a above).

- c. Proactively identify new university researchers in disciplines with high commercial potential and notify the Office of Technology Transfer of their hiring so the Office can make initial contact.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The University will evaluate how best to incorporate the relevant exposure in new faculty orientation and other established programs that would increase the contact between new faculty and the OTT.

- d. Require the Office to develop a mechanism for informing university inventors of the university's technology transfer process. One possibility may be in the form of a technology transfer reference pamphlet, CD, or DVD to be distributed to new employees and those inventors conducting research in areas of high commercial potential. Among other things, the Office should include information on the services that it offers, what is expected of the researcher, intellectual property legal matters, and contact information, and should direct university researchers to the Office's Web site for further information when required.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Finding 2: All three universities – particularly UA – should improve aspects of marketing and all three should review their negotiation practices.

1. UA should develop and implement an evaluation system to weigh technologies against standard criteria to determine which technologies to focus its marketing resources on. UA should use these criteria to prioritize new disclosures and routinely reassess old ones. The assessments could be performed in-house or by market experts and UA should determine which is suitable based on relative

cost and the industry expertise available throughout the university.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The OTT will examine the protocols used by at least three other technology transfer offices and create a standardized system to capture its evaluations of technologies.

2. UA should increase its marketing efforts for select technologies, identified through an evaluation, by:

- a. Advertising promising technologies through a press release, at trade shows, or through other literature-recommended forums;

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The OTT will continue working with the university news and information services to promote promising technologies and utilize a portion of new funding to increase its presence at selected trade shows.

- b. Continuing its efforts to increase market research in strategic industry areas to adequately evaluate technologies and to identify and understand the target companies;

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

- c. Increasing personal relationships with industry through face-to-face meetings or networking at industry events; and

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The OTT will utilize a portion of new funding to increase its presence at selected trade shows and showcases.

- d. Increasing its efforts to identify and contact potential licensees.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The OTT will continue its efforts in creating new approaches to marketing technologies that are scalable and cost-effective as well as increasing its licensing efforts through targeted networking at trade shows and showcases.

3. UA should evaluate whether its technology transfer program staffing levels are adequate and take steps to increase program resources as needed.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Steps have been taken and additional program resources will be made available beginning in FY 2009. These resources are: (i) additional budget for two licensing managers with one position being a joint position with Optical Sciences; and (ii) additional budget for information resources and direct marketing activities.

4. As part of its review of sponsored research practices, UA should take steps to improve its technology transfer-related negotiations with industry:

- a. Working industry to identify their concerns and needs regarding technology transfer and to determine how they can more effectively work together;

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The UA receives 12.5% of its contract awards by dollar value for research with industry, on par with the best performing universities in the U.S., and exceeds both the performance of its peers and the national average in expenditures for industry-sponsored research. The UA will continue to look for ways of working more effectively with its industry collaborators. To do this, the

University (i) has hired Nancy Smith as Director, Corporate and Business Relations under the Vice President for Research to enhance communications with industry; (ii) is participating in industry-university forums dedicated to improving understanding on both sides; and (iii) will examine new approaches to industry-sponsored research agreements.

- b. Developing specific technology transfer goals related to industry collaboration efforts; and
The finding of the Auditor General is agreed to and audit recommendation will be implemented.

The new Director of Corporate and Business relations has begun to construct a comprehensive approach to the UA's business and corporate relations. This will encompass goals related to industry collaboration efforts.

- c. Determining how its negotiation process can be improved to meet the goals and evaluating its progress by identifying and collecting data on relevant performance measures.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The Office of the Vice President for Research will identify relevant performance measures and initiate data collection.

Finding 3: All three universities – particularly UA and NAU- need to better manage conflicts of interest, and the Board should establish minimum standards.

1. To help ensure that all conflicts of interest are identified, the UA should adopt and implement policies and procedures that require initial and continuous identification of them. Specifically:
 - a. At minimum, UA should require all faculty involved in sponsored research to fill out an annual conflict-of-interest disclosure form, in which they must disclose any substantial interests related to their research or other university responsibilities, to include disclosure to publications when they submit manuscripts; to their audiences when they present research results; to federal agencies according to their guidelines; and in the human participant review process. Further, UA should require disclosure of relevant changes to previous disclosures.
 - b. UA should determine what office or entity will be responsible for ensuring that employees submit the annual disclosures, reviewing the disclosures, and forwarding them to the Institutional Review Committee for review.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The current conflict of interest policy is being revised to require annual, continuing, and project-based disclosure by all faculty members involved in sponsored research. Furthermore, all committee communications with faculty shall include language that requires faculty to inform the Institutional Review Committee (IRC) of changes in their relationships to the disclosed entity. To coordinate disclosure of substantial interests in the human subjects review process, a representative of the Human Subjects Protection Program attends all IRC meetings and will verify that faculty have properly disclosed to the HSPP. The IRC shall utilize disclosure of substantial interests in publications, presentations and federal agencies as a regular feature of a management plan. The revised policy shall indicate that the Assistant Vice President (AVP) for Research Compliance and Policy, in the Office of the Vice President for Research, shall collect and review disclosures, forward them to the IRC for review, and maintain records of disclosures, decisions, management plans, and monitoring.

2. To help ensure that UA is consistently managing its inventor conflicts of interest, UA should develop and implement conflict of interest polices and procedures that include criteria for when to recommend a conflict-of-interest management plan and guidelines for areas that should be included in the plan.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Consistency in management of conflicts of interest is critical and the revised policy will carefully describe what types of financial relationships must be disclosed, when, and to whom; it will also describe why certain financial relationships might be problematic and why management plans are sometimes necessary to protect the integrity of the research; it will also carefully define relationships that are likely to require management plans and what those management plans are likely to entail. It is, however, important to allow the IRC the freedom to exercise its judgment in a case-by-case manner, allowing for different circumstances of individual investigators and allowing for management plans to be specifically tailored to the exact circumstances of the case at hand. We will be guided by the samples suggested, including the University of Wisconsin, Stanford University, University of California, Irvine, and University of Pennsylvania.

3. To ensure its policies are followed, UA should:
 - a. Assign responsibility for what office or entity will be responsible for implementation and monitoring of management plans;
 - b. Coordinate university-wide management among the various offices involved, including Sponsored Project Services (SPS), The Office of Research and Contract Analysis (ORCA), the Office of Technology Transfer (OTT), the Office of the Vice President for Research, and UA inventor's dean or department chair. In particular, UA offices that help inventors to obtain research funds and license technologies, Sponsored Project Services and the Office of Technology Transfer, should identify inventors with potential conflicts of interest and forward information to the Committee responsible for their management.
 - c. Ensure that it informs all faculty involved in research of these policies, procedures, and sanctions for noncompliance.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The Office of the Vice President for Research and, specifically, the AVP for Research Compliance and Policy, will provide oversight monitoring of disclosure and management plans. The revised conflict of interest policy will specify the exact reporting lines and the appeal process for investigators perceived as non-compliant. SPS and OTT will provide a list of faculty research agreements and licenses to the AVP for Research Compliance and Policy on a regular basis. Coordination among campus units will be accomplished through revised proposal routing sheets, increased communication, and, within a short time, an electronic system of proposal routing and compliance activities. This system, Quali, currently in development with a national consortium of universities, will combine in one system all of the compliance requirements for sponsored research and will allow faculty to engage the system as they move through the proposal and research process. Finally, we are in the process of hiring a Research Compliance Training Coordinator who will work with the AVP for Research Compliance and Policy to develop training materials, web sites, and workshops to conduct active and ongoing outreach to the research community regarding its compliance obligations, including conflict of interest.

4. To address outstanding conflicts as of March 2008, UA should establish and implement an immediate short-term plan to identify and manage potential conflicts of interest for inventors actively participating in sponsored research.

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

The AVP for Research Compliance and Policy will establish a short term plan for identifying and managing potential conflicts. With the IRC, the AVP for Research Compliance and Policy will implement the plan and work to identify investigators with potential conflicts and establish management plans as necessary.



Office of the President

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May 16, 2008

Ms. Debra Davenport
Auditor General
State of Arizona
2910 North 44th Street, Suite 410
Phoenix, AZ 85018

Dear Ms. Davenport:

We have received the Auditor General's performance audit report on the technology transfer programs at the three state universities. Northern Arizona University has no significant issues or concerns with the report and, in general, is in full agreement with the report's findings. Attached is Northern Arizona University's response to the recommendations. We have agreed to address and implement all recommendations.

We would also like to provide an overall context of recent events surrounding our technology transfer provider, Arizona Technology Enterprises (AzTE), relevant to our responses.

Since January 19, 2006, AzTE has been providing technology transfer and intellectual property evaluation services to Northern Arizona University under a written "Services and License Agreement," scheduled to remain in effect for five years. We were notified in March that AzTE wishes to change the terms of this agreement and to alter the means in which services are provided. In some respects, the suggested changes would reduce (rather than enhance) Northern Arizona University's provision of technology transfer services to its faculty, staff, and student inventors. Therefore, we are reviewing the AzTE proposed changes and investigating alternative service providers. We anticipate moving to a new services and license agreement, either with AzTE or another vendor, within the next several months. This will enable Northern Arizona University to fully implement the recommendations included in the report.

Sincerely,

John D. Haeger
President

Northern Arizona University
Auditor General's Performance Audit
University Technology Transfer Programs
May 2008

Finding 1: Universities can take steps to increase commercially viable invention disclosures.

Recommendation 1.

To promote disclosure activity by increasing in-person interactions with faculty, NAU should work with AzTE to develop a schedule for AzTE employees to visit NAU's campus periodically throughout the year to meet with NAU inventors. Alternatively, NAU could assign staff to assume some of these technology transfer responsibilities or contract all or some of these technology transfer services to another provider. Any arrangement should ensure that the level of interaction between NAU inventors and technology transfer staff is increased.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The NAU Vice President for Research has requested written proposals from AzTE as well as other, more local, potential service providers in order to obtain more frequent and dependable visits on campus with NAU inventors.

Recommendation 2.

To encourage more faculty participation in technology transfer, NAU should consider hosting annual recognition ceremonies for their inventors who have been active in technology transfer.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The Vice President for Research will work with the Provost and the President to identify the most appropriate venue(s) in which to recognize faculty, staff, and student inventors who have been active in technology transfer.

Recommendation 3.

To better educate faculty, and increase their exposure to the technology transfer process, NAU should:

Recommendation 3a.

Identify the departments known for producing commercially viable research and then conduct workshops for department faculty.

Response

The finding of the Auditor General is agreed to and the audit recommendation is being implemented. For example, in April 2008 NAU hosted a workshop organized by the Northern Arizona Center for Emerging Technology, "Invention

to Venture,” and invited faculty, staff, and student inventors. The Vice President for Research will plan and conduct regular workshops for current and potential campus inventors aimed at various steps of the technology transfer process.

Recommendation 3b.

Encourage research-intensive departments to invite the technology transfer provider to their meetings on an annual basis.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The NAU Vice President for Research will work with the service provider selected to ensure research-intensive departments are identified and the provider meets with them at minimum annually.

Recommendation 3c.

Proactively identify new university researchers in disciplines with high commercial potential and notify AzTE of their hiring so they can make initial contact.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The NAU Vice President for Research has requested written proposals from AzTE and other potential service providers. We agree to proactively place the service provider selected in contact with new and existing university researchers.

Recommendation 3d.

Require its technology transfer provider to develop a mechanism for informing university inventors of the university’s technology transfer process. One possibility may be in the form of a technology transfer reference pamphlet, CD, or DVD to be distributed to new employees and those inventors conducting research in areas of high commercial potential. Among other things, NAU’s technology transfer provider should include information on services that it offers, what is expected of the researcher, intellectual property legal matters, and contact information, and should direct university researchers to the provider’s or NAU’s Web site for further information when required.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented when we identify the provider of Technology Transfer support. NAU has already created an overview document (“Frequently Requested Information on Intellectual Property”) and a web site (<http://www.research.nau.edu/vpr/techtransfer.html>) intended to introduce university inventors to the technology transfer process. The Vice President for Research will work with the selected service provider to create additional materials and mechanisms for informing university inventors and streamlining their interactions with the service provider(s).

Finding 2: All three universities should improve aspects of marketing and review their negotiation practices.

Recommendation 1.

NAU should work with AzTE to take steps to mitigate the disincentive that the university's physical distance creates and ensure that appropriate marketing efforts are pursued. Alternatively, NAU could assign staff to assume some of these technology transfer responsibilities or contract all or some of its technology transfer services to another provider. Any arrangement should ensure that NAU technologies are appropriately evaluated, adequately researched for marketing purposes, and discussed with industry contacts as appropriate.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented as we identify the provider of Technology Transfer support. As part of the vendor selection and negotiation, we will ensure the service provider selected will work more closely with the Vice President for Research to identify and pursue appropriate marketing efforts.

Recommendation 2.

NAU should take preventative steps to streamline coordination of industry sponsorship among its technology transfer provider, the faculty inventor, and NAU. NAU should also consider developing specific technology transfer goals related to industry collaboration efforts and determining how its negotiation process can be improved to meet the goals. It should evaluate its progress by identifying and collecting data on relevant performance measures.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented as we identify the provider of Technology Transfer support. As part of the vendor selection and negotiation, we will establish steps for coordination of sponsorship among industry supporters, faculty inventors, the university, and the service provider. The university will develop specific goals for our technology transfer efforts, identify appropriate metrics, and establish data collection processes to be implemented by June 30, 2009.

Finding 3: All three universities – particularly UA and NAU – need to better manage conflicts of interest, and the Board should establish minimum standards.

Recommendation 1.

To help ensure that all conflicts of interest are identified, NAU should adopt and implement policies and procedures that require initial and continuous identification of potential conflicts of interest. Specifically:

Recommendation 1a.

At a minimum, NAU should require all faculty and staff involved in sponsored research to fill out an annual conflict-of-interest disclosure in which they are asked if they have any substantial interests related to their research or other

university responsibilities. Further, NAU should require disclosure of relevant changes to previous disclosures.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented. Currently, the NAU Investigator Financial Disclosure Form is required and submitted with all proposals to NSF and NIH. The disclosure is updated annually for all funded projects. The University is currently exploring the most effective ways of coordinating a general conflict of interest reporting mechanism for all faculty with an annual conflict-of-interest disclosure related to research, including sponsored projects. In that regard, the University recently sent out annual appointment letters to approximately 800 faculty. Included with each appointment letter was a memorandum from President Haeger and Provost Grobsmith explaining faculty member's responsibilities under Arizona conflict of interest laws and a notification form for faculty to complete that describes their ownership and compensation relationships with entities other than the University.

Recommendation 1b.

NAU should determine what NAU office or entity will be responsible for ensuring that employees submit the annual disclosures, reviewing the disclosures, and, if necessary, forwarding them to a committee or other university official for review.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented. The disclosures received from faculty and staff engaged in sponsored research will be reviewed by the employee's immediate supervisor and such review will continue up the supervisory chain with final responsibility residing with the cognizant vice president.

Recommendation 2.

To help ensure that NAU is consistently managing NAU inventor conflicts of interest, NAU should develop and implement conflict-of-interest policies and procedures that include criteria for when to recommend a conflict-of-interest management plan and what the plan should include.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Recommendation 3.

To ensure clear responsibility for conflict of interest management, NAU should:

Recommendation 3a.

Determine what NAU university offices or entities will be responsible for implementing and monitoring conflict of interest management plans.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.

Recommendation 3b.

Ensure university-wide coordination on conflict-of-interest management among the various offices involved, including the Office of the Vice President for Research, Sponsored Project Services, the Office of Grants and Contracts, the institutional review board, and the office that manages NAU's intellectual property.

Response

The finding of the Auditor General is agreed to and the audit recommendation will be implemented.



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Arizona State University

Northern Arizona University

University of Arizona

May 16, 2008

Ms. Debra Davenport
Auditor General of the State of Arizona
2910 North 44th Street, Suite 410
Phoenix, AZ 85018

Dear Ms. Davenport:

Thank you for the opportunity to review the revised preliminary report draft of the performance audit of university technology transfer programs. The report is well-done and we believe the system will benefit from the recommendations you have made.

The report includes one recommendation to the Arizona Board of Regents:

RECOMMENDATION:

To help ensure effective technology transfer-related conflict-of-interest management at all universities, the Board should establish minimum standards for universities' conflict of interest policies and procedures, including standards for initial and continuous identification of conflicts of interest and standards for restrictions to manage conflicts of interest and enforcement of those restrictions.

ABOR RESPONSE:

The Arizona Board of Regents agrees with this finding and the audit recommendation will be implemented.

Thank you to you and your staff for their work on this audit. Technology transfer and conflict of interest are important issues for the Arizona University System and we appreciate this thoughtful review.

Sincerely,

Joel Sideman
Executive Director

c: Fred Boice
Richard Gfeller
Nancy Tribbensee

*Board Members: President Fred T. Boice, Tucson Robert B. Bulla, Scottsdale Ernest Calderón, Phoenix
Dennis DeConcini, Tucson Fred P. DuVal, Phoenix LuAnn H. Leonard, Polacca
Anne L. Marlucci, Phoenix Bob J. McLendon, Yuma
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