MBI URO Scenario

PURPOSE

Under this envisioned MBI-based University Research Organization (URO) scenario, the MSU Board of Trustees would contract with MBI International to house new, extramurally funded projects ("URO Projects") not normally undertaken within the balance of the University proper, including particularly those extramurally supported research projects with publication restrictions1. Such restrictions might arise in disclosure prohibitions or requirements for external publication approval contained in funding awards or associated non-disclosure agreements, or through limitations on project participation based on citizenship or legal residency.

In principle, the MBI URO could also undertake classified projects, but the initial Board of Trustees approval sought for the MBI URO Scenario would not include classified projects2.

ABOUT MBI INTERNATIONAL

MBI International (MBI) is a 501(c)(3) not-for-profit corporation and a wholly-owned subsidiary of the MSU Foundation, another 501(c)(3) not-for-profit corporation. Both MBI and the MSU Foundation are incorporated in Michigan.

Information about MBI may be found at http://www.mbi.org/. As indicated on that site:

"MBI applies multidisciplinary expertise, bench-scale laboratories and a robust flexible approach to utilizing pilot-plant facilities to accelerate the development and scale-up of bio-based technologies. We partner with both universities and end-user companies to bridge the gap between early innovations and commercial applications.

1 Section 8 of the "Major Guidelines" for Research and Creative Endeavor, as passed by the Graduate Council on May 15, 1967 and the MSU Board of Trustees on March 20, 1970, reads in part:

"The University should retain for its scholars the right of first publication. The imposition of restriction on publication of research results is incompatible with the basic concept of an educational institution. Exigencies of national defense may at times make exceptions to this policy on publication necessary."

2 There are at least two major rationales for the avoidance of classified work at MBI URO, at least initially and possibly forever. The MBI URO concept is a significant departure from past practice at MSU, and a deliberate, stepwise approach to significant change is prudent. Moreover, such an approach permits the expansion of the projects that may be undertaken by U.S. citizens and some permanent residents affiliated with MSU, without necessitating that they obtain personal security clearances.
"MBI’s focus is in the area of Industrial or White Biotechnology, which refers to the production of fuels, chemicals, polymers, proteins and other materials from renewable resources."

MBI offers a number of advantages as a potential URO, including:

- long experience as a Federal contractor;
- long experience with private sector research funders;
- long experience as an MSU-focused research collaborator; and
- a mature internal legal structure (Board of Directors, internal policies, etc.).

At the same time, the quoted self-description of MBI illustrates that its current operational posture is focused on specific core competencies. The posture and competencies are significantly narrower than the range of activities that an MSU URO will need to undertake. Thus, although the balance of this document refers simply to “MBI”, that reference should be understood to stand either for MBI en toto or alternatively a new division of MBI created to separate URO activities and financial accounting from those of the current operational posture. (Creation of a wholly owned MBI subsidiary is another possible option, although that approach could negate or reduce the advantages of MBI’s existing Federal contractor status.)

RELATIONSHIP STRUCTURE AND FACILITATING CONTRACTS

In principle, MBI could undertake URO Projects in a wide variety of forms, including:

a. projects proposed and conducted by MBI, or with non-MSU prime or subcontractors, but without work conducted at MSU;
b. projects proposed by MBI, and conducted by it (with or without others), with some work performed at MSU under a subcontract for research³;
c. projects proposed by MBI, and conducted by it (with or without others), with some work performed at MSU under a subcontract for testing;
d. projects proposed and conducted by MSU (with or without others), with a subcontract to MBI for either research or testing.

MSU would enter into one or more contracts with MBI for the following:

1. Compensation of MSU by MBI when MBI hires MSU personnel as employees or private contractors/consultants.
2. Compensation of MSU for work performed on campus under a research subcontract.

³ Absent a national security exigency, the results of such subcontracted research at MSU would necessarily have to be publishable under Board of Trustees policy. This distinguishes case “b” from case “c”, as testing is not so constrained.
3. Compensation of MSU for work performed on campus under a testing agreement.
4. Compensation of MBI for work performed by MBI for MSU under subcontract.

Project case “a” could include contract mode “1”, or no contract mode whatever.

Project case “b” would include contract case “2” and could include contract mode “1”.

Project case “c” would include contract case “3” and could include contract mode “1”.

Project cases “b” and “c” could be combined, necessarily hybridizing contract cases “2” and “3”, and the hybrid could also include contract mode “1”.

Project case “d” would include contract case “4” and could include contract mode “1”.

The foregoing case-by-case analysis illustrates a key fact: regardless of the contract structure of any given URO Project undertaken by MBI, MBI could utilize MSU personnel as its own employees or independent contractors/consultants. There are three noteworthy ways in which that could occur:

(i) on an “own time” basis for MSU hourly employees, or others outside of their appointment periods or less-than-fulltime level of effort fractions;

(ii) under the “outside work for pay” policy for personnel governed by it; or

(iii) by secondment.

MSU has nothing to say about case “i”. In case “ii”, reporting and approval of the outside work for pay is required by MSU policy. Beyond realizing salary savings in case “iii”, MSU would voluntarily incur an opportunity cost (e.g., lost F&A / indirect cost recovery from alternative contract and grant activity inside MSU, lost personally authoritative supervision of MSU research students, etc.) and would therefore rationally seek compensation from MBI. Some MSU deans have been very clear that recovery of F&A / overhead opportunity costs4 by colleges and departments is an essential element of any acceptable URO plan. Such recovery would become a routine element in contract mode “1” agreements covering case “iii”. The possibility of such recovery in case “ii” will be attractive in some quarters and controversial in others.

Secondment to an outside entity can cause a variety of policy challenges that would need to be addressed in one or more contracts between MSU and MBI. Issues to be addressed include:

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4 These costs are typically understood to correspond to college and department shares of the MSU F&A / overhead that would have been generated, had identical research been performed inside MSU.
• **Consistency with the rules of tenure, sabbatical eligibility, retirement eligibility, etc.** As a fundamental URO design criterion, participation in the MBI URO by secondment should not affect tenure for those who hold it. (Implications for those seeking tenure are discussed in detail below.) Similarly, retirement and sabbatical eligibility should not be adversely affected.

• **Intellectual property rights.** As a fundamental URO design criterion, MSU inventors in the MBI URO should be neither advantaged nor disadvantaged as individuals, relative to MSU inventors on campus.

• **Conflicts of commitment.** As one key example, on-campus teaching and student supervision cannot legitimately be let suffer due to MBI URO participation.

• **Conflicts of interest.** MSU and MBI policies will need to be harmonized, in light of emerging Federal policy. Institutional conflict of interest may pose a special challenge, if and when Federal policy addresses it.

• **Anti-discrimination, research integrity, export controls and trade sanctions, human subjects protection, laboratory animal care, etc.** Conduct of research in the MBI URO cannot reduce the compliance responsibilities MSU personnel are expected to meet.

MSU possesses institutional experience in dealing with such challenges: e.g., with the MSU College of Law and other entities, as well as in secondment of MSU personnel to Federal and state agencies.

Beyond the MSU personnel retained by MBI, the MBI URO would initially hire a small cadre of personnel, primarily composed of U.S. citizens but possibly including permanent residents, to assist in the launch of URO Projects. The immediate availability of such staff is essential to support URO Projects that carry export control or other restrictions on participation by non-U.S. persons\(^5\). The cadre of MBI URO personnel could be expanded or contracted at later dates in light of operating performance and needs.

The MBI URO would be conducted in purpose-specific MBI space. Such an approach offers significant advantages:

• MBI URO space can be secured against access by non-U.S. persons without detracting from the general openness of the MSU campus proper;

• MBI URO space needs will not compete with new on-campus initiatives and traditional academic programs for scarce laboratory space; and

• MBI URO space usage can provide a F&A / indirect cost income stream to the MSU Foundation for space at the MBI Building or elsewhere in the University Research Park.

**DETAILS OF INITIAL MBI URO STAFFING**

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\(^5\) A “non-U.S. person” is someone who is neither a U.S. citizen nor a U.S. permanent resident.
The following information includes hypothetical salary levels for the specific and limited purpose of financial modeling.

At its inception, MBI URO would be staffed as follows:

- **Executive Director (1.0 FTE – not directly project billable; $150 K base)**
  - This individual would likely possess a PhD degree or DoD-related government, military, or industry experience; preferably both.
  - The first duties of the Executive Director would be (i) hiring the Project Specialists and Project Technicians, and (ii) negotiating the involvement of faculty to be seconded by MSU to MBI URO *pro tem* as Project Leaders with MBI URO-appropriate funding that they have themselves attracted. The latter duty would persist through time, and the Executive Director would begin to shoulder funder-relations duties as well.
  - This individual should be a U.S. citizen, due to the likelihood of oversight of Department of Justice data system-related projects for which permanent residents are ineligible.

- **Financial Manager (1.0 FTE – not directly project billable; $75 K base)**
  - Initially, this individual would handle MBI URO books on a part-time basis.
  - This individual should be a U.S. citizen or permanent resident.

- **Regulatory Compliance Officer (1.0 FTE – not directly project billable; $75 K)**
  - This individual would address the full spectrum of MBI URO regulatory compliance issues. Ideally, part of the F&A / overhead recovery for secondment opportunity costs would be “earned” by MSU by various MSU offices providing specialized advice to this generalist.
  - This individual should be a U.S. citizen, due to the likelihood of oversight of Department of Justice data system-related projects for which permanent residents are ineligible.

- **Grant Writer (1.0 FTE – not directly project billable; $75 K)**
  - This individual would work with MBI URO staff, MSU collaborators, and outside collaborators to prepare and submit nationally competitive proposals for URO Projects.
• This individual should be a U.S. citizen, due to the likelihood of preparation of Department of Justice data system-related proposals for which permanent residents are ineligible.

• Administrative Assistant (1.0 FTE - not directly project billable; $40 K)

  o This individual would support the Executive Director and the MBI URO staff. Respecting the latter duty, the existence of the Administrative Assistant is intended to meet audit requirements for separation of financial functions.
  o This individual should be a U.S. citizen or permanent resident.

• Six (6) Project Specialists (6.0 FTE – billable to projects; $75 K base)

  o From the standpoint of participating MSU faculty, the MBI URO provides two key services: (i) an MSU-affiliated venue in which research is permissible despite external publication restrictions, and (ii) the ready availability of project staff who will meet funder, ITAR⁶, and EAR⁷ requirements for their access to proprietary or legally controlled technology and data. Providing a pool of PhD-prepared Project Specialists in anticipation of their eventual project billability poses several challenges. They include:
    • cost,
    • uncertain job security, and
    • the diversity and unpredictability of the expertise demands arising from faculty problem selection and proposal success, both of which are beyond the organizational control of the URO.
  o A balance must be struck between the issues of cost control and diversity of expertise. For purposes of analysis, it is assumed that six Project Specialists will be retained by the MBI URO at start-up, with a distribution of skills such as the following:
    • An applied mathematician or statistician
    • An analytical chemist or criminal forensic scientist
    • A mechanical engineer
    • An electrical engineer
    • A software analyst or engineer
    • A microbiologist or related biology or food science expert, with molecular genetics experience.
  o The salaries for the six anticipated positions will reflect the variation in individual qualifications, field-related wage differences, and the uncertain duration of individual employment pending eventual

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⁶ International Traffic in Arms Regulations
⁷ Export Administration Regulations
billability outcomes. An average salary of $75,000 is assumed for modeling purposes.

- The possibility of projects involving Department of Justice data systems, from which permanent residents are contractually excluded, suggests that the software analyst/engineer and the analytical chemist/forensic scientist should be U.S. citizens. Ideally, the other positions should be filled with U.S. citizens as well, but permanent residents could be considered.

- Four (4) Project Technicians (4.0 FTE – billable to projects; $40 K base)

  - Compared to a URO model of cross-major administrative unit secondment internal to MSU, provision of an adequate core cadre of technicians at the MBI URO via secondment is complicated by collective bargaining issues. Accordingly, four MBI technicians are assumed to be part of the MBI URO core.

  - As in the case of Project Specialists, providing a pool of bachelor’s-prepared Project Technicians in anticipation of their eventual project billability poses several challenges. They again include cost, uncertain job security, and the diversity and unpredictability of the expertise demands arising from problem selection and proposal success, both of which are beyond the control of the M&O operating entity.

  - For purposes of analysis, it is assumed that the four Project Technicians retained by the MBI URO at start-up will offer a distribution of skills such as the following:

    - A chemist, chemical engineer, or biochemist with analytical instrumentation experience, possibly including forensic methods
    - An engineer with integrated mechanical and electrical fabrication and data collection experience
    - A software programmer/analyst
    - A biological technician, with animal-handling and/or polymerase chain reaction experience

  - The salaries for the four anticipated Project Technician positions will reflect the variation in individual qualifications, field-related wage differences, and the uncertain duration of individual employment pending eventual billability outcomes.

  - The software programmer/analyst and any forensics scientist or technician should be U.S. citizens, due to the possibility of Department of Justice data system-related projects. Ideally, the other positions should be filled with U.S. citizens, but permanent residents could certainly be considered.

  - The precise mix of individual backgrounds between the Project Specialists and the Project Technicians should be considered in optimizing the MBI URO staff hires. Special attention to computer
programming skills will be needed, as such skills may be found in many of the disciplines represented in the staffing mixes contemplated above.

The estimated base salaries, an approximate 40% fringe benefit loading rate, and the headcounts result in $854 K per year in potentially billable personnel costs, plus $581,000 in non-directly billable personnel costs.

FINANCIAL MODEL

Appendix A provides a concise, single-page summary of a six-year financial model for the MBI URO.

The model begins by assuming the amount of total dollars (including F&A, a.k.a. "indirect costs" or "overhead") that will be accepted by the MBI URO in each twelve-month period. The model next assumes that half of the awarded dollars will be spent in the year of acceptance, one-third in the second year, and one-sixth in the third. This decay rate reflects the fact that some awards will be only one or two years in duration. The fifth line of the model totals estimated annual expenditures for old and new awards.

From the annual expenditure totals, a certain dollar value (20%) is attributed to external subcontracts and another (10%) to equipment purchases. (Obviously, those figures are rough approximations of fluctuating amounts.) They are subtracted from the annual expenditure totals to find the amount of F&A-bearing direct costs plus the corresponding F&A for each year. The next line of the model identifies the F&A alone, assuming a constant 115.62% negotiated F&A rate for MBI.

The model next indicates the F&A dollar values provided to MSU (and thence to the colleges and departments as recovery of the opportunity costs associated with secondment) in consideration of regulatory compliance assistance. Significantly, the amount is precisely what the colleges and departments would receive from equivalent non-URO research grants at full MSU research F&A. As noted above, that outcome has been identified as essential by some MSU deans.

The next lines of the model are (a) the personnel costs of the MBI URO specialists and technicians, (b) the lesser of "a" and an amount (50%) hypothetically available from the total annual direct expenditures for the billability of those specialists and technicians, (c) an amount (85%) of the specialists' and technicians' potentially

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8 This should be a systematic underestimate, because a small amount of F&A can be recovered from the first $25,000 of each subcontract. The question of the number of subcontracts issued then becomes relevant; many small subcontracts will yield more F&A than one big one.

9 This F&A rate will astonish some faculty, who may feel that its size will dampen funder enthusiasm for MBI-based activity. As of this writing, the most recent Federal F&A rate negotiation for MBI was in 2005.
billable time that is an effective upper maximum on their Federal billability, and (d) the resulting annual subvention needed from F&A for unbillable specialists’ and technicians’ time. The amount in “d” is the greater subvention cost resulting from (i) “a” + “b” and (ii) “a” + “c”.

At MSU, F&A return to colleges and departments lag their being earned, and this lag is reflected in the next line of the model. Payments calculated on an earlier line in year “N” are shown as made in year “N+1”. This creates an F&A “payable” liability, beginning in the first year.

In the next two lines, the model shows the direct project expenses in each year, and the sum of prior-year grantor receivables plus 50% of the new year direct expenses (i.e., the latter amount is how much the model expects to be reimbursed by grantors the same fiscal year expenses occur: half.)

Next the model estimates MBI URO square footage needs and costs. In the 2011 year, $600,000 in total (direct plus F&A) expenditures are estimated to require 1,714 square feet of rental space at $28/sqft. (The rate is increased $1/sqft every second year. This is a blended approximation that likely understates rent inflation but overstates the evolving ratio of expensive lab space to relatively less expensive office space needed for the eventual URO Projects. To assist the reader, projected square footage needs in square feet are shown at the bottom of Appendix A. Vis-à-vis this rent, it should be noted that MBI does not own the MBI building; the MSU Foundation is the landlord.)

The next line of the model reflects the F&A subvention needed for non-billable MBI URO administrative personnel with a small supplies, services, and equipment (SSE) budget.

Thereafter, the model nets the direct project expenses and annual subventions for space rent, unbilled billable personnel, and non-billable personnel (with SSE) against grantor reimbursement. As a not-for-profit approximation of profit and loss, the next line sums the that with the change in receivables earned, less the change in payables due.

The next line of the model shows a “ramp-down” capitalization plan for MBI URO consisting of investments of $2.0 M in 2011, $1.1 M in 2012, and $0.4 M in 2013.

The final lines of the model are a simplified balance sheet, from which balancing grant F&A amounts contracted but not yet earned are excluded under both assets and liabilities. Similarly, balancing lines for subcontracted obligations are also omitted. The first line of the asset list is the annual cash position. The equipment expenditures estimated earlier, net of a five-year straight-line depreciation, are shown second. The earned but not received grantor reimbursement is shown as the third line of the assets, all of which are then summed. Cumulative shareholder investment is derived from the ramp-down capitalization plan above, and the F&A share payable in lagging years to MSU is shown as the second line of the liabilities.
The change to shareholder value is calculated to balance the simplified assets and liabilities.

**COMMENTARY ON FINANCIAL PROJECTIONS**

It will be noted that after beginning in 2011, MBI URO shows a not-for-profit “profit” in 2013, simultaneously showing a net positive change in shareholder value that year. The projected onset of profitability reflects the effect of the large F&A rate, regarding which re-negotiation uncertainties may exist.

Two easily overlooked aspects of this model also derive from the 115.62% F&A rate. For a fixed amount of total extramural support, a URO with a higher F&A rate necessarily has a lower direct cost expenditure. Therefore (i) on average it will perform less research, and (ii) it will return less money to MSU for redistribution to colleges and departments, because the 10.4% rate for such return in the model is applied to a lower direct cost amount. At the same time, the change to shareholder investment will be very favorable. Of course, the latter amount will be reduced if the non-URO portion of MBI to which the URO division is added looks to the URO division for cross-subsidy.

It is reasonable to ask why the current MBI balance sheet does not show results similar to those shown in the model. Today, MBI does not attract the level of peer-reviewed Federal support from any agency sources equivalent to the level anticipated in the URO financial model from Defense and Homeland Security agencies or prime contractors. Additionally, MSU faculty members typically do not solicit projects with the intent of executing them through MBI rather than through MSU, because most Federal biotechnology projects within the current MBI core competency do not carry publication restrictions. Moreover, “de-risking” – which MBI currently emphasizes -- is not the focus of expected URO research. The value proposition for the MBI URO rests in different sources of funding, for different research topics, pursued with a different staffing model.

**THE SPECIAL ISSUES OF GRADUATE STUDENTS, POST-DOCS, TENURE, ETC.**

The ability to accept projects with publication restrictions rests at the heart of the rationale for MBI URO. Those restrictions pose special problems for project participation by graduate students seeking to complete degree requirements, for post-docs seeking to establish themselves as known investigators, and for junior faculty seeking tenure.

Graduate students in thesis or dissertation programs must be able to publish because -- by virtually universal academic convention -- the thesis or dissertation is
itself a publication. Additionally, some Ph.D. programs require journal submission or acceptance of at least one research manuscript prior to degree completion. If a graduate student who is a U.S. citizen (or usually, a permanent resident) conducted her or his research within MBI URO, the student would at a minimum be accepting third party censorship of that research, and hence could be left without anything publishable despite the investigative success of the project. Thus, there exist several policy options for the University, including the choices to:

- Permit the student to propose MBI URO-based research to a graduate committee in anticipation that a fraction of that research would reliably be publishable without active third party changes and that fraction would be sufficient to meet otherwise unmet thesis or degree requirements;
- Permit the student to conduct MBI URO-based research as a research assistant, on the basis that non-MBI URO research would be conducted in parallel and the latter would be sufficient to meet thesis or degree requirements without necessitating use of the MBI URO portion;
- Permit the student to participate in MBI URO projects only on the labor payroll with the expectation of being treated as a technician, rather than as a junior investigator, and hence holding no expectation of research inclusion in a thesis or dissertation.
- Seek MBI contractual agreement to refrain from graduate student participation in MBI URO projects altogether.

In principle, the Graduate School could seek a university-wide MSU doctrine regarding those choices, or alternatively accept disciplinary or committee-by-committee variations.

Post-docs typically hold short duration positions that must serve as stepping-stones to more permanent appointments elsewhere. Increasing national attention is being paid to the need for positive post-doc mentoring and the avoidance of post-doc exploitation. A post-doc who exhausts the period of her or his appointment without significant publications will likely be far from competitive for academic and other coveted positions where prior publication is an expectation.

Unlike graduate students (for whom publication is a degree completion requirement), some post-docs can complete successful appointments without publications and gain remunerative permanent posts with employers for whom researcher expertise and customer satisfaction take priority over open publication. (Defense and homeland security contractors frequently fit that description, with the Federal government serving as the customer to be satisfied.) Moreover, the effective use of post-doc appointments to prepare some researchers for national security-related positions is arguably in the national interest, as well as that of the researchers themselves. Thus, the policy issue to be addressed is what sort of initial

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10 The traditional requirement for a "public defense" of the candidate's research is also relevant.

11 An advantage of this option is its minimization of MBI URO's differential impact on graduate students based on citizenship.
“informed consent” should be required from a post-doc when s/he is seconded into a MBI URO position in which publication foreseeably will be difficult or impossible? As a corollary, one might inquire whether a certain level of professional experience - e.g., a prior post-doc appointment without publication restrictions -- should be considered a prerequisite to giving such consent. (Varying disciplinary use of post-doctoral appointments complicates these questions. Post-docs remain rare to unknown in certain fields.)

Finally, a significant question arises concerning the impact of MBI URO participation on career trajectories for young faculty. Stanford has addressed this head-on with Section 3-c of its May 31, 2007 policy12 entitled “Openness in Research”. The policy preserves the ability of that institution to enlist international scholars in judging research intended to be world-class:

“Scholarly activities not accessible for scrutiny by the entire Advisory Board should not be considered in connection with appointments, reappointments or promotions.”

Beyond the question of international tenure reviewers’ judgment of papers per se, unpublished work is also necessarily un-cited as well. This may further complicate the fair assessment of a junior scholar’s impact.

A less obvious issue is that an MSU investigator whose most important work is conducted in MBI URO may find her or his chances for recruitment into academic positions elsewhere – whether due to denial of tenure at MSU or due to prestigious senior recruitment “raids” -- to be significantly diminished at institutions that share Stanford’s philosophy.

THE LIMITING CASE TEST

Adopting the physical sciences’ penchant for limiting cases, it is useful to consider the cogency of the case for creating the MBI URO under consistently conservative operational policy parameters – specifically:

- Graduate student participation in MBI URO is contractually foreclosed;
- Post-doc participation is permissible only if in an appointment following at least one post-doc appointment not involving publication restrictions; and
- Assistant professor secondment is permissible only after mid-probation re-appointment and with prior written commentary on the decision to participate from the Reappointment and Promotion Committee in the assistant professor’s tenure home.

The over-arching question then becomes, “Can MSU faculty attract extramural support for projects consistent with the Financial Model and execute them at the

MBI URO under those policy constraints?" Ultimately, the researchers concerned, their line administrators, and the University academic governance system should best answer that question. Relaxation of one or more of the limiting case constraints predictably would strengthen the feasibility case for the MBI URO.

URO experiences at peer institutions, the extensive current availability of MBI URO-style extramural funding, and the frequency with which publication restriction difficulties now arise under the long-standing Board of Trustees policy requiring open publication all deserve collegial attention at MSU. Together, they combine to create a *prima facie* case in favor of the MBI URO, justifying its broad review and discussion on the MSU campus.
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<td>(264,478)</td>
<td>(348,885)</td>
</tr>
<tr>
<td>Direct Project Expenses</td>
<td>(624,645)</td>
<td>(1,321,882)</td>
<td>(3,331,441)</td>
<td>(4,893,054)</td>
<td>(6,454,667)</td>
<td>(7,235,474)</td>
</tr>
<tr>
<td>Grantor Reimbursement Rec'd</td>
<td>500,000</td>
<td>1,958,333</td>
<td>4,125,000</td>
<td>6,583,333</td>
<td>9,083,333</td>
<td>10,958,333</td>
</tr>
<tr>
<td>Square Footage Rent Covered</td>
<td>(56,000)</td>
<td>(163,333)</td>
<td>(309,333)</td>
<td>(454,333)</td>
<td>(620,000)</td>
<td>(665,000)</td>
</tr>
<tr>
<td>Non-billable Personnel + SSE</td>
<td>(601,000)</td>
<td>(519,030)</td>
<td>(637,601)</td>
<td>(656,729)</td>
<td>(676,431)</td>
<td>(696,724)</td>
</tr>
<tr>
<td>Annual Change in Cash Position</td>
<td>(1,473,323)</td>
<td>(1,085,854)</td>
<td>(387,752)</td>
<td>259,169</td>
<td>923,580</td>
<td>1,833,748</td>
</tr>
<tr>
<td>Ann. Change Cash + Receivables</td>
<td>(1,007,086)</td>
<td>(192,233)</td>
<td>738,987</td>
<td>1,424,761</td>
<td>2,089,172</td>
<td>2,416,544</td>
</tr>
<tr>
<td>Staged Investment</td>
<td>2,000,000</td>
<td>1,100,000</td>
<td>400,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Asset - Running Cash Balance</td>
<td>526,677</td>
<td>540,823</td>
<td>553,071</td>
<td>812,240</td>
<td>1,735,820</td>
<td>3,569,567</td>
</tr>
<tr>
<td>Asset - Equip (5 Yr Depreciation)</td>
<td>100,000</td>
<td>371,667</td>
<td>826,667</td>
<td>1,425,000</td>
<td>2,116,667</td>
<td>2,726,667</td>
</tr>
<tr>
<td>Asset - Grantor Receivable</td>
<td>500,000</td>
<td>1,458,333</td>
<td>2,666,667</td>
<td>3,916,667</td>
<td>5,166,667</td>
<td>5,791,667</td>
</tr>
<tr>
<td>Total Assets w/o Out Yr Grants</td>
<td>1,126,677</td>
<td>2,370,823</td>
<td>4,046,404</td>
<td>6,153,906</td>
<td>9,019,153</td>
<td>12,087,901</td>
</tr>
<tr>
<td>Liability Shareholder Investment</td>
<td>2,000,000</td>
<td>3,100,000</td>
<td>3,500,000</td>
<td>3,500,000</td>
<td>3,500,000</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Liability - Payable to MSU</td>
<td>33,763</td>
<td>98,476</td>
<td>180,070</td>
<td>264,478</td>
<td>348,885</td>
<td>391,089</td>
</tr>
<tr>
<td>Change to Shareholder Invest.</td>
<td>(907,086)</td>
<td>(1,085,854)</td>
<td>(387,752)</td>
<td>259,169</td>
<td>923,580</td>
<td>1,833,748</td>
</tr>
<tr>
<td>Total Liabilities w/o Out Yr Grants</td>
<td>1,126,677</td>
<td>2,370,823</td>
<td>4,046,404</td>
<td>6,153,906</td>
<td>9,019,153</td>
<td>12,087,901</td>
</tr>
<tr>
<td>Estimated Square Footage</td>
<td>2,000</td>
<td>5,833</td>
<td>10,667</td>
<td>15,667</td>
<td>20,667</td>
<td>23,167</td>
</tr>
</tbody>
</table>