Spring 2-28-1990

Senate Meeting, February 28, 1990

Academic Senate
Illinois State University

ACADEMIC SENATE MINUTES

February 28, 1990 Volume XXI, No. 12

Call to Order

Roll Call

Approval of Minutes of February 14, 1990

Chairperson's Remarks

Vice Chairperson's Remarks

Student Body President's Remarks

Administrators' Remarks

ACTION ITEMS:

1. Rules Committee Proposal for Change In Athletic Council Bylaws (Tabled)
2. Appointment of Douglas Hardwick, Psych. to Facilities Planning Committee
3. Appointments of Four Students to SCERB Grievance Committee

INFORMATION ITEM:

Academic Affairs Proposal for M. S. in Geo-Hydrology

CONSTITUTIONAL AMENDMENTS:

1. To Increase Student Senators to 21 (defeated)
2. "The President of the University shall serve as a non-voting member." (defeated)
3. Student Representation by College (defeated)
4. "The Vice Chairperson shall be a student Representative" (passed)

Communications

Committee Reports

Adjournment

Meetings of the Academic Senate are open to members of the University Community. Persons attending the meetings may participate in discussions with the consent of the Senate. Persons desiring to bring items to the attention of the Senate may do so by contacting any member of the Senate.

ACADEMIC SENATE MINUTES

(Not Approved by the Academic Senate)

February 28, 1990 Volume XXI, No. 12

CALL TO ORDER

Chairperson Len Schmaltz called the meeting of the Academic Senate to order at 7:06 p.m.

ROLL CALL

Secretary John Freed called the roll and declared a quorum present.

APPROVAL OF MINUTES OF FEBRUARY 14, 1990

Senator Newby: Correction on Page 9, next to last paragraph:

Senator Zeidenstein: Page 15, second paragraph, should be preceded by "Point of order."

Page 16, fourth paragraph, should have a question mark at the end of the sentence: "And 23 is one more than a quorum?"

XXI-77 Motion to approve the Minutes of February 14, 1990, as corrected by Taylor (Second, Ritch), carried on a voice vote.

Chairperson's Remarks

Chairperson Schmaltz: In the past the Institute for Advanced Study at Princeton has seen fit to appoint as fellows such notables as Dr. Albert Einstein, Niels Bohr, and George Kennan. I am pleased to report that the institute continues in that tradition. I found out that one of our own senators has been appointed a fellow at the Institute of Advanced Study at Princeton. Congratulations to Senator John Freed. It is a joy to honor one of our faculty members and particulary one from the Academic Senate.

Vice Chairperson's Remarks

Vice Chairperson Rendleman had no remarks.

Student Body President's Remarks

Student Body President Dan Schramm: This being my last Senate meeting, it has been an honor and a privilege to serve with all of you and I wish you the best of luck in the future.

Administrators' Remarks

President Wallace had no remarks.

Provost Strand: I would like to make a comment about the non-tenure track faculty positions on campus. As members of the Senate who were on the Senate last year are aware, there was a motion made by the Senate and some guidelines were recommended for non-tenure track faculty and a report on this topic was requested from our office. The report was provided initially to the full Senate and then a more detailed report was given to the Faculty Affairs Committee of the Academic Senate. There has also been activity within the program review process that also pertained to non-tenure track faculty. I want to say, for the record tonight, to members of the Senate who are interested in this topic that in addition to those actions I am in the process of meeting with the Deans of the various colleges to ascertain ways in which the number of non-tenure track faculty will be reduced so that we can move in the direction of those guidelines and can monitor on a department-by-department basis the number and use of non-tenure track faculty as it relates to the entire faculty in a particular department. While I would be reluctant to give percentage numbers in terms of reductions, it will be one of my priorities to work with college deans and department chairs to see that the number is reduced and the purposes for which they are used complies with the guidelines of the Senate.

Vice President for Student Affairs Neal Gamsky had no report.

Vice President for Business and Finance James Alexander had no remarks. However, he had received a memorandum from Senator Kagle which raised some questions.

Senator Kagle: Before I begin my questions, I would like to explain what I am talking about. The College of Business acquired three electronic sign billboards -- half of which publicize certain college functions and the other half advertise chocolate. These were installed in Stevenson and Williams Halls which are classroom and office buildings. The signs are about six feet on each side, square. Those who have not seen them can observe a similar sign advertising computers right outside the Discount Den. My first question is: Has the University arranged to have the candy bar sign taken down?

Vice President Alexander: No.

Senator Kagle: OK. The Dean of the College of Business indicated in a letter to me that I was the only one who had complained about the sign. I have petitions that prove otherwise. I can assure the senate that many have complained to me and that I am not acting on my own, but as a spokesman for many of my constituents. I would like to ask Vice President Alexander if he has seen the signs?

Vice President Alexander: Yes.

Senator Kagle: I would like to ask if you personally object to them?

Vice President Alexander: I would suggest to you that there is a sign policy in the University Policy Manual. I am sure that you have a copy of that policy. As I indicated to you, the policy by its terms notes that permission or approval for erecting signs is one of the duties of the Office of Institutional Advancement. As I indicated to you, I believe Dean Jefferson has been out of the country, and I have not been able to discuss with him about the approval process he went through before erecting the signs. I believe it is appropriate to determine through the Office of Institutional Advancement whether or not such approval was given. If not, what is the appropriate action to be taken? Also, regarding the answer to those two questions, what is the nature of the acceptance of the policy. Since I have been unable to process what is the policy of the institution in that manner, I believe it is appropriate to refer your questions to the Office of Institutional Advancement and to proceed based on their response.

Senator Kagle: I would wonder what you call Items 2 and 4 under that policy. It says, first of all that al signs must be approved. Yes, but the only signs that can be in buildings are departmental and office signs. Item 4 says, "No signs will be made for other facilities within a building. Rather, each building is to have a directory inside the entrance on which departmental, laboratory and similar facilities will be noted." Even if approved, these signs do not fall within that sign policy.

Vice President Alexander: The response that I have is, the last paragraph reads: "The intent of this policy is to maintain a uniformity in signage on the campus and to reduce the potential for visual pollution through a proliferation of signs." I believe the reason to follow the three steps that I indicated, is that I am not aware of what acceptance of such signs has been in the past. I am not sure that this sign, offensive as you may find it, will be inconsistent with those past exceptions. I am not prepared to take a position about my own personal feelings about the sign prior to going through that exercise.

Senator Kagle: The Dean of the College in his letter suggested that my objection was probably on the basis of aesthetics. Ethics and morals aside, I want to ask the following questions. If this is not in violation of University Policy, Board of Regents' Policy, or state guidelines or law, if it is not, can any faculty member, a department, or a college choose to sell or barter advertising space on its walls?

Vice President Alexander: I would suggest that the answer lies within the confines of the policy. Certainly you could not do it without the prior approval of the Office of Institutional Advancement.

Senator Kagle: If I got that approval, could I for example arrange to be given or lent computer equipment for research and classes by allowing the use of my office door for an advertising poster?

Vice President Alexander: I am not prepared to deal with hypotheses.

Senator Kagle: Could my department sell or barter space on its syllabi in exchange for books or audiovisual equipment? Couldn't we arrange to have MacDonalds cater our departmental colloquia by agreeing to wear T-shirts and caps displaying Golden arches when we went to class, or couldn't the President arrange for the use of an official car with a Garcia's Pizza Tomato on the top? Might not the University raise salaries by selling the right to title professorial chairs? For example, could Professor Schmaltz become the first Clausen Pickle Professor? And are there limits to what type of advertising we will and will not permit? Could we have advertisements for beer, diet pills, cigarettes, condoms, abortion clinics? What about ads recruiting students to work as agents in the CIA or waitresses in a topless bar? What about Paid Political Advertisements? Would we allow ads for the American Nazi Party? Or only Democrats, Republicans, and LaRouchites? Would we allow religious ads? If so, would they be for only the mainline religions or would we accept ads from the Moonies or Satanists? Do we have to take bids before renting out our walls or bodies? Are we legally obligated to sell ourselves to the highest bidder, or can we just take the first offer that comes along?

Senator Arnold: Point of order. We need to remind ourselves periodically, that the Academic Senate is all about the governance of the academic programs of the University. I don't see what this has to do with academic programs.

Chairperson Schmaltz: So you want me to rule Senator Kagle out of order? Perhaps we would reach a compromise here. Senator Kagle, are you about through?

Senator Kagle: Given these problems and very serious political issues that we face here and public relations issues that we face at the University, is the University going to look for ways to take those kinds of signs down, and not open up this Pandora's box?

Vice President Alexander: I don't think these rhetorical questions expect or require an answer from me. I believe I have responded to the questions you have posed.

Senator Zeidenstein: I have a comment. Senator Arnold raised a point of order. My point of order is that Senator Kagle is in effect saying, "Give me a sign," which in effect constitutes a prayer, which is dangerously close to violating the constitutional prohibition of church and state. On those grounds, if none other, I think we might go on with Senate business.

Senator Ritt: I have a question. I learned today in the public press that there is going to be a referendum on a student recreation building. That $20,000 in student fees have been spent in preparation for this. My question is simply, has this matter been discussed by the Student Affairs Committee of the Senate?

Senator Schramm: My answer to that is no.

ACTION ITEMS

1. Rules Committee Proposal for Change in the Athletic Council Bylaws

XXI-78 Senator Newby moved the approval of the Changes in the Athletic Council Bylaws (Second, Rendleman) to read as follows:

1. Membership

B. Faculty

A slate of candidates shall be presented to the Senate as an information item, at which time nominations from the floor may be added. All nominees must be approved by the President of the University and the Chairperson of the Academic Senate as well as a majority of the Executive Committee before the slate is forwarded to the Senate for election. (Delete "The" from the present wording.) Faculty shall be elected by the Senate to staggered 3-year terms each Spring. The term of service shall begin July 1 following the elections. A minimum of three faculty members must be women, and a minimum of three faculty members must be men. No more than one faculty member may be from the same department.

XXI-79 Senator Walker: I move to lay it on the table (Second, Liedtke). Motion carried on a voice vote.

2. Rules Committee Recommendation for a Faculty Appointment to the Facilities Planning Committee

XXI-80 Senator Newby: Rules Committee moves to nominate Douglas Hardwick, Psychology, to a 1990 term on the Facilities Planning Committee to fill a vacancy created by the resignation of David Weber. (Second, Goldstein)

XXI-81 Motion to close nominations by Rendleman (Second, Goldstein), carried on a voice vote.

Dr. Hardwick was appointed to the Facilities Planning Committee by acclamation.

3. Recommendation for Student Appointments to SCERB Grievance Committee

XXI-82 Senator Rendleman nominated four students for appointment to the SCERB Grievance Committee: Deborah Sue Klein, Michelle Argomanez, (regular members) and Kevin Bergquist and Kerry Ryan (alternates). (Second, Newby) None of the students were on academic or disciplinary probation.

XXI-83 Motion to close nomination by Taylor (Second, Fisher) carried on a voice vote.

Students elected to SCERB Grievance Committee by acclamation.

INFORMATION ITEMS

Academic Affairs Committee Proposal for M.S. in Geo-Hydrology

Senator Taylor: We have two representatives of the Department of Geography/Geology present tonight for questioning: John Foster, and Dr. Robert Corbett, Chair of the Department. Dr. Corbett will give a brief presentation and then open it up for questions. The addendum that we referred to in our January meeting has been distributed to Senators.

Dr. Robert Corbett: Thank you. Ladies and gentlemen of the Senate, we are here in connection with the information session for our proposal, M.S. in Geo-Hydrology. Let me mention that I am relatively new to ISU. I come with the experience of having designed two masters degrees in areas of Geology -- Engineering Geology and Environmental Geology. Without being too self-serving, perhaps I am fresh enough on campus to comment and evaluate this particular program. The principle author of this program is on my left, Professor John Foster, so credit or blame for any aspects of this I think he will stand up and accept or recognize. Let me share with you that this is a well-crafted program, narrowly focused and designed to prepare specialists in the most rapidly growing field in the geological sciences today. There is by the calculations of the National Water Well Association, a current ratio of ten jobs for qualified persons in this field for every current qualified graduate from universities in the United States. I think it is to ISU's credit, and particularly that of the Geography/Geology Department, to be far-sighted enough to work toward establishing this well-crafted program as long as three or three and one half years ago. The program has been put together in such a way that it is quite impressive to outside reviewers. I can say that

first hand, because I have travelled to several places in the State of Illinois with a copy of the program asking for such a review from persons off campus in a position to recognize whether or not this filled a real need. Without spending a lot of time going over the details in this introductory session, let me just indicate to you that it is a fine program and that there is a real need. We find it wholly consistent with maintaining the reputation of ISU as having a premier undergraduate education because this is focused on people with a Bachelor of Science degree to go on and obtain a Master of Science degree. This in no way adds a technician component to the undergraduate education. That is a point we all agree on very strongly in our department. With that, I will thank you for allowing me to make these comments.

John Foster: We really have an opportunity at hand to make a national and perhaps world-wide reputation in respect to this proposed program. We came about this by coincidence rather than long-term design. I am a non-traditional type member of the faculty, and have the pleasure of about 32 years of serious work in industry around the world, and I perhaps benefitted by coming in from the outside. I can perhaps then see what needs to be done and can be done in academia. I have appreciated very much the acceptance in the various committees that have looked at this Geo-Hydrology NEPR proposal. Both Dr. Corbett and I are ready to defend it if we must in an honest and forthright way.

Senator Kagle: Certainly in looking over the proposal, it looks like something very exciting and something that the State needs. It is a very well-prepared proposal. One area that I question is that is says there are no programs like this in the State.

John Foster: Yes. Not like this. Not in the country. There are a number of institutions that offer both a Masters Degree and a Ph.D. in Geology with an accent on Hydro-Geology, but neither of those universities have the faculty nor the understanding of the problems in Geo-Hydrology to make the same challenge that we are making. You have read of the fact that the word Geo-Hydrology is a rather unusual term. Not yet fully recognized in the country. Hydrogeology simply means ground-water geology. That to me implies accent on the physics of the aquifers, but not the hydro-dynamics of the groundwater. Our program under what I think is a very appropriate title, puts the accent where the accent needs to be, not in straight Geology, but in Hydrodynamics which, as I have pointed out in here, was rather advocated by Geology as a profession to the Civil Engineering firm, and we are not getting it back where it belongs. Civil Engineering has not done well with geo-hydrology and slowly we are beginning to have that recognized, completely accepting the fact that it is a field of geology where it belongs. The engineering profession in general does not have the geological understanding to do well in the dynamics of the subsoils.

Senator Kagle: So, it is not only a distinct program, but it is also an unusual program in starting at the undergraduate level and encouraging students to go into graduate programs elsewhere.

John Foster: I think that is very true. I believe that we would be setting a very admired precedence here in respect to these absolutely firm and fixed core courses at the 400 level and the two 300 level that I currently teach that are part of that core. I think it will be admired and no doubt copied in due time. But there is no other program in the country that I know of, that is of this character.

Senator Alstrum: Perhaps the two representative from the Geography/Geology Department don't know all the past history of the department. Maybe they do, I don't know. I am of the understanding that your department at one time had some graduate degrees. Does it currently offer any graduate degrees?

Dr. Corbett: There are no Masters degrees offered. In 1984 the Masters Degree in Geography was eliminated.

Senator Alstrum: What were the reasons for that?

Dr. Corbett: I get varying stories as a relative newcomer, but I think it was a combination of students that perhaps were not of high quality and lack of purpose on research and perhaps an attitude of not publishing among the faculty. Plus, it was at a time when the University was trying to reduce the amount of programs.

Senator Alstrum: In regard to the potential market, you have indicated that there is nothing comparable to this nationally. Within the department in your undergraduate majors, do you have a pool of geology majors who might want to pursue this?

Dr. Corbett: Yes, we do. We have some recent graduates that ask us monthly, "Is this program in sight?" These are people who are working as professionals who want to come back and gain the value of this two years of advanced study.

Senator Alstrum: Can you give us some kind of idea as to the number of students interested.

Dr. Corbett: This is anecdotal, but I have had inquiries from five graduates in the last three months.

Senator Alstrum: My last question would be directed toward the administration as well as the department. If this were to be approved, what is the degree of advocacy that will exist on the part of the administration to see that this program is established?

Provost Strand: I feel very positive toward this program. I think it is responding to a societal need. We have the expertise on the faculty and the unique combination of circumstances which make this a flagship type of program for Illinois State University and members of my staff and I are very supportive and will recommend the program strongly to the Board of Higher Education and the Board of Regents.

Senator Ritt: I hope that what I am about to ask is not interpreted as hostility toward the program. I think it is a splendid program. It would be my finding that the degree of preparation of people coming out of your undergraduate program is probably appropriate to the program which you are offering The question that disturbs me a little bit is that the word hydro-dynamics in most scientific and engineering circles has different connotations than the ways in which you refer to it. I am afraid that at some point there is going to be misunderstanding of this and that at some point someone is going to say that students with this level of mathematical and physics preparation are not really prepared to do hydro-dynamics. The question which I am raising has nothing to do with the substance of the program at all. The question is, is there some better word for this program than hydro-dynamics? When you say you want to train students in hydro-dynamics, wouldn't hydrology be a better description of what you are talking about here?

John Foster: We could use the word geo-hydro-dynamics rather than just the term geo-hydrology. The point needs to be made that we are covering two areas of this science. One is groundwater as a resource, and the other one is groundwater as a carrier of contaminents relative to the environmental fields. One of those is involved in the bahavior of ground water in the sub-surface. I don't use the word hydro-dynamics intentionally without the word geo as a prefix in front of it.

Senator Ritt: I would suggest that that be made perfectly clear in the proposal. However, it has to be worded to reflect that.

John Foster: Would that make it clear? Geo-hydronamics?

Senator Ritt: Yes, that is right. Hydro-dynamics is something which almost anybody, especially in the University system, would regard as a discipline which requires mathematical tools which are simply not required in the kinds of problems that you are trying to solve.

John Foster: I disagree there. The solving of the problems on the movement and behavior and the prediction of ground water are highly mathematical and not academic. They are highly classical, but involve both calculus and advanced algebra.

Senator Ritt: Hydro-dynamics as a subject goes far beyond calculus and advanced algebra. We are talking about caution differential equations, Stokes' equations, complex variables, it goes in a different direction. People might get a misconception and be fooled because there is nothing easy about the problems you are trying to solve. But, it does not depend upon the kind of mathematical tools which are associated with the discipline of hydro-dynamics.

John Foster: I certainly would agree with you there, and I would be pleased to make sure that the reference is made in respect to the sub-surface behavior of groundwater.

Senator Goldstein: Being involved in a Master's level program here, in some disciplines the Master's students are beginning to replace Ph.D.s in their fields. Particularly in the demands for licensing in order to control them. What is the possibility that these students would replace Ph.D's in the field? What is the likelihood for the market to continue?

Dr. Corbett: I think that quite clearly the demand is for people at a master's level. We have done surveys on the nature of employment and professional trade figures and by and large experience at a Master's degree level is preferred. From talking to people who are doing the hiring and our working professionals in the field, the experience is unique because no one offers a package of courses as germane as this for training while in school. So we anticipate that our graduates will in effect bypass two or three years of apprenticeship in a consulting firm learning what was not available in the college program.

Senator Mohr: In Appendix B, there is a reference: "The Geography/Geology programs primary strength is its people and its uniquely positive esprit de corps. The faculty is close-knit, harmonious, dedicated and hardworking." To what extent will all members of the Geography/Geology Department be involved in this program?

Dr. Corbett: I think all the faculty members are supportive of this. To answer the question directly, there are three of us most directly involved. We anticipate one additional full-time faculty member to add strength that we really need and a quarter-time appointment for a local attorney to teach ground water rights.

Senator Richardson: Who are the faculty members that will be mostly involved?

Dr. Corbett: Robert Nelson, John Foster, and myself.

Senator Richardson: Dr. Nelson is also experienced?

Dr. Corbett: Yes.

Senator Richardson: So you three would be primarily responsible for this program?

Dr. Corbett: Yes.

Senator Richardson: You made a comment in respect to pollution in ground water. I see there is a course on Geology of Waste Disposal. Are you going to get much into the nature of chemical waste, etc.? Do you have any expertise on waste disposal and the pollution of ground water? I was just thinking that in Biology, Dr. Huizinga is especially qualified on this subject.

Dr. Corbett: I have ten or fifteen journal articles on this subject.

Dr. Tuttle: It is primarily three people and possibly a fourth who will be responsible for this new and unique program. It probably depends upon a small pool of new faculty members. My question is: are you convinced that five or ten years down the road ISU will be able to find faculty who could step into this program and replace present faculty members who either retire or leave the University? Is this going to be a problem, and because this program is unique, can the pool of potential faculty out there fill replacements?

Dr. Corbett: Our egos would say, "Yes, it would be hard to replace us." But I think that the reality of it is that no one is indispensable. No, I do not think it would be a problem to find faculty for this program.

Senator Stearns: I see you have requested $182,000 in new resources for this program. My question is, is the program dependent on the new resources? My second question is, there appears to be approximately $41,000 for graduate assistantships. Do you intend to subsidize your enrollment with these graduate assistantships?

Dr. Corbett: The answer to the first question is that we could not honestly carry the program forth without these new resources.

Senator Stearns: There appear to be ten graduate assistantships. This is a typical number. To operate a program dependent upon graduate assistantships, are you subsidizing enrollment?

John Foster: Those assistantships were certainly not designed as a means of subsidizing the enrollment. I am personally confident that we could develop over a short period of time the full quota of 24 students -- 12 in the first year and 12 in the second year without any scholarships of this type. On the hand, it is the way things are done in academia, and if the number of graduate assistants were reduced by the Board of Higher Education from ten to eight or whatever numbers were satisfactory, that

would not worry me very much. The expected intention was to reach our enrollment maximum in the shortest possible time.

Dr. Corbett: But, we do need some graduate assistantships.

Senator Stearns: Then you do not plan to subsidize spots?

Dr. Corbett: We expect less than one in three enrolled students to have an assistantship. The answer is that we feel we can draw students without it. It is that we need it to carry the program forth.

Senator Walker: Those were the same questions raised by the Budget Committee in regard to reallocation of funds. We were reassured at that point in time by the Provost and Dr. Batsch that indeed this program would not go forward unless funds came from a NEPR or whatever it took. They would go with the program, but it could not be started without that money. We felt comfortable and that ten was an appropriate number of graduate assistantships. We felt that the funds requested were appropriate at this point in time. The Budget Committee was satisfied with this program request.

CONSTITUTIONAL AMENDMENTS

1. To Increase the Number of Student Senators to 21

84 **Motion by Schramm (Second, Rendleman) to change:**

Article V. Academic Governance, Section 1. Academic Senate,
A. Membership:

DELETE: The membership of the Academic Senate shall consist of 27 elected faculty members, 17 elected student members, the.....

ADD: The membership of the Academic Senate shall consist of 27 elected faculty members, <u>21</u> elected student member, the.....

Senator Schramm: What this proposed constitutional amendment would entail is to increase the student membership from 17 elected seats to 21 elected student members. Basically, what this amendment would do is get more students involved in the Senate. There is nothing wrong with that. It would also increase the number of graduate students, not just the undergraduates. Currently of the seats alloted to students, it is apportioned according to total enrollment. Right now 88% of the seats are alloted to undergraduate students, while 12% of the seats are alloted to graduate students. If the student membership was increased to 21, with those same percentages, it would allow for three graduate seats and 18 undergraduate seats. It would increase graduate student representation also. Another thing this would do would be that the Senate could not

meet with only one group present. In essence, this would increase the total membership to 54. A quorum of the Senate dictates that it is half plus one which would mean 28 members. Basically, in regard to the quorum issue, if there are any fears from certain constituencies that students would get fed up and walk out of the Senate, that the Senate could not meet, I would say that was an irrational fear. There are also Administrators that would supplement the faculty attendance. They have 27 regular elected members plus four administrators, which makes 31. Basically, you could still meet and vote. I think that by increasing the number of students, besides the fact that it get more students involved, it better typifies the notion of shared governance. In the Constitution, Section V, 1. it says, "The primary governing body at Illinois State University shall be the Academic Senate which shall provide for faculty and student participation in academic governance." I perceive that to mean that there should be some give and take there. As I stated before, the faculty would still retain voting power in this.

Senator Rendleman: I would simply like to add that increasing the number of students means that should all the students be gone and one faculty member, plus the administrators, that Senate would not have a quorum to meet. I think it is important that this concept be accepted because it means that the Senate is almost required to take the students positions and ideas and listen to them. While many of you will remember the walkout of 1989 and say that was horrible, I would tend to agree with you on that. But, it is a matter of fact, that the students felt that their ideas were not being accepted. Because we didn't have the vote, our ideas were not worthy.

Senator Schramm: Coming from a student perspective, which only a student who sits here on the Senate can see, it is very hard to continually come to the Senate meetings when you feel that your opinions are not being taken into consideration. I don't want to imply that that is always the case. However, in the past two years, that has occurred. I would also like to add that by changing the Constitution there has been a fear of many people, an attitude of: "If it's not broke, don't fix it." On these proposed Constitutional Amendments, I would just like to say that any Consitution for whatever body it is, explicitly has sections in it that allow for change. A Constitution to a body is the most progressive form of legislation that it holds. If I can use the example of our United States Constitution, it has the provision in there that if the people who are being protected under this constitution feel that their rights are being taken away or that they are not having equal voice and that representation is being hindered, it is their right to forward legislation to change that. I am addressing particularly the faculty members here, your voting power would still be maintained. I would ask that you have some faith in the future students who are going to be elected to this body.

Senator Rendleman: There are not a lot of issues that divide the students and the faculty. On almost all issues, there is complete agreement. The most telling, I believe, was the proposed Board of Regents' Changes. The students came out in force. While I had to explain a couple of times the various implications of the Proposed Changes to some students, and some of us did not understand completely all the changes, we came out and supported that because we knew it was a matter that affected ISU, the faculty, administrators and future students. There aren't many issues which divide us. We feel that we should have on those issues which do, at least a chance to force the issue.

XXI-85 Senator Walker: I move the question. (Senator, Tuttle) Roll Call vote: 26 yes; 15 no; 1 abstention. Motion to move the question failed for lack of a 2/3 majority.

Senator Schram: Before you there is a sheet that was passed out that lists the slate of the students who are running for the undergraduate and graduate positions on the Senate. As you can see there are 47 students who are running for undergraduate positions next year for the fifteen spots; and 3 graduate students running for two openings. This will show that there are students in demand for these positions. There would not be a shortage of students interested if the ratio was raised to 21 seats. The student body wants to get involved in the Senate. I would ask that the members of the Senate vote yes to allow that to happen.

Senator Mohr: The reason I voted in favor of closing discussion is that this is a fundamental issue of do you want more students on the senate or don't you? I don't see what there is to debate.

(XXI-84) Vote on Amendment to the Constitution #1 failed on a roll call vote: 17 yes; 24 no; 1 abstention.

2. "The President of the University shall serve as a non-voting member."

XXI-86 **Motion by Schramm (Second, Rendleman) to change:**

ARTICLE V, Academic Governance, Section 1. Academic Senate, A. Membership

DELETE: ....., the President of the University, the Vice President and Provost, the Vice President and Dean of Student Affairs, the Vice President for Business and Finance, the President of the Student Body, and the Student Regent.

ADD: ....., **the President of the Student Body, the Student Regent, the Vice President and Provost, the Vice President and Dean of Student Affairs, and the Vice President for Business and**

Finance. The President of the University shall serve as a non-voting member.

Senator Schramm: On Page 19 of the ISU Constitution, in Article V, Section 1., it says: "Within the limits established by legislative statute and the authority delegated thereby to the Board of Higher Education and the Board of Regents, the Academic Senate shall be the primary body to determine educational policy of the University and to advise the President on its implementation." Also, on Page 20 of the Constitution, under Functions, it says: "16. Advise the President on any matter, at the President's request or on the initiative of the Academic Senate." From the Senate Bylaws, Section II, number 22, reads: "Policy Approval by the President, Before any new policy or any modification of existing policy may become effective, it must be approved in writing by the President. Such policy shall be consistent with the policies of the Board of Regents, the Illinois State University Constitution, and the decisions of the Academic Senate. Also, under that same section 2, number 21, the last sentence reads: "Committee recommendations shall be forwarded to the President and to the Academic Senate." Basically, the fact that the Senate advises, does not mean that it orders the President to do something. In my interpretation, it says that the matter goes to the President and advises him. An example, our United States Senate passes legislation that goes to the President of the United States. The President of the United States is not ordered to accept that legislation, he has a veto power. With that, I have no other comments.

Senator Ritt: I have a prepared statement. This proposed amendment to the Constitution should be rejected. During the past twelve months the system of shared governance at Illinois State University has been pushed aside. Approval of this amendment would ratify this displacement. It would provide a constitutional basis for what has merely been, until now, refusal by the President to adapt to the constitutionally defined functions of the Academic Senate.

The constitutional designation of the Academic Senate as the primary body to determine educational policy of the University has been ignored, as has been the constitutional requirement that it be the Senate to provide the method by which members of the academic community be involved in the determination of certain policies and in the participation of the formulation of others.

Instead of shared governance we have had shared administration. Faculty committees have been created, and are in the process of being created, given a charge relative to a specific area, and report to the administration. In effect, faculty are being shuffled into and out of the central administration, to do the investigations and analysis that the central administrators would normally be expected to do. The more competently and conscientiously the committees respond to their charge, the

greater they have been manipulated into providing a document which suits the agenda of the administration.

This is not speculation. We have seen it happen. Consider the hours of committee meetings, subcommittee meetings, retreats and sober expositions by imported authorities on strategic planning, which culminated in the University Vision Statement. Of what use was this statement? We were informed by the President, through the press, that it was a vision statement -- it wasn't really supposed to be of any use.

Senator Rendleman: Point of order. I see nothing relevant about the President's vote to the vision statement.

Senator Ritt: How did it differ from earlier University mission statements? Insignificantly. How was it going to be implemented? "Through the usual budget processes" -- In short, after the scenery has been put away and prancing elephants bedded down for the night, the serious business of strategic planning will be done, the policy decisions will be made, the Senate will be uninformed and unconsulted, and the information will leak out to the academic community after the deans have been given their marching orders. At this point, if questions are asked in the Senate, we will be told that dissection of administrative behavior is inappropriate. Our own good manners and concern for the public image of the University will silence us; if not, we will nevertheless be dealing with a fait accompli.

How much simpler, less expensive, and more productive it would be, if the strategic plans being developed within the administration were to be brought to the appropriate Senate committees for consultation and discussion. That is what shared governance is supposed to be. If this had been done, for example, with respect to the enrollment problem, the results would have been more satisfactory.

Enough. If more illustrations are required, they can be supplied.

From what slender constitutional thread does this behavior hang? It is the same as the rationale supplied by the proposers of this amendment.

What is this rationale? If one reads Article V, Section E., and concentrates on the word "advise," being careful not to read anything else in the article nor anything else in the Constitution, one draws the conclusion that the Senate is only advisory to the President. This description of the function of the Academic Senate has been repeated so often by this President and his predecessor that it has become part of the common folklore.

When the Academic Senate, in accordance with its parliamentary procedures, brings to the floor legislation in any area which Article V. E. says it can, and passes that legislation, that legislation is the policy of the University. The only advisory aspect consists of recommendations by the Senate in regard to implementation.

If the President believes the legislation to be unwise, he has the options of implementing it in a manner to defeat its objectives or not implementing it, neither of which would be wise, or invoking Senate Bylaw 2.2. This does not change the policy -- it simply relieves him of a constitutional obligation to implement it. He does not have the option to replace the policy by one which he prefers.

Bylaw 2.2 could be discarded by the Senate action, and it would not require Presidential approval to do so. My judgement is that this would be a mistake. The present arrangement forces the majority of the Senate and the President, when they disagree, to resolve the differences if either wants to accomplish anything. It is essential to the successful functioning of the University that the President participate in the debate and cast his vote.

If this President chooses not to participate, and to operate completely exterior to the constitutionally established system, then that is probably what we must live with. It would nevertheless be a foolish act for us to amend the Constitution to make it easier for him to do this. Thank you.

Senator Kagle: The proposers stated information about the Senate's function "and to advise." Before that conjunction it states that the Senate determines policy. What that suggests is that the Senate is not merely an advisory body. Therefore, there are going to be areas in which we will be taking action that will not be solely advisory. I would certainly encourage the President to participate in these actions. He may, of course, as he has done in the past, choose to abstain. This is his right. But, I would want to keep him on the Senate as a voting member, not only in those areas where the Senate determines policy which is advisory, but to reinforce the principles of shared governance on the Senate, That principle is that this institution, like all institutions of higher education, is essentially a community of scholars. Not only faculty members, but also students and administration. The Administrators must see themselves as scholars and indeed in most cases, as faculty as well. I want to reinforce the position that the President, while serving as the primary administrator in this institution is also a valued faculty member and a valued scholar. If he were to remain a voting member of the Senate, it would encourage him to participate as a faculty member and as a scholar.

Senator Zeidenstein: No one can force anyone to vote, if he or she does not want to, for whatever reason, good or ill. Anybody can abstain at any time. But, there may be a time when the incumbent President of this institution wishes to vote, and if we pass this amendment, he will not be allowed to. There may be a time when some future President on a future Senate wishes to vote, and if we pass this amendment, that future President will not be allowed to. If there is a redeeming quality to Amendment #2, it is that it reduces by removing one voting member from the administration, the size of the quorum. That redeeming factor does not compensate for its drawbacks. Therefore, I will vote against this amendment.

Senator Tuttle: I would like to point out to many people here the history of the way in which we created the Academic Senate. The Senate was created to determine academic policy of the University and to advise the President on its implementation. We set up a system of shared governance where the President and the administration share with the faculty and the students in this process. That means voting. Presidents can choose to ignore the Senate and basically not participate in the Senate. We all know that we had a President that chose to do that. And we all know what he just about did to this campus. That was his option and his choice. He goes back far enough that many of you don't remember that. But, that was detrimental to this campus and to the shared governance process that he chose to ignore this body and did not participate and did not vote. The question of voting is a critical one. I think that the shared governance concept suggests that the President would make a contribution along with the rest of the University -- a contribution to the decision-making process in determining policy. I would argue that the President continue to have the right to vote. It is consistent to how and why our shared governance process was created that the President have the power to vote. I think he should continue to have it. I would urge my colleagues to vote against this amendment.

Senator Schramm: Dr. Tuttle, what is your interpretation of shared governance?

Senator Tuttle: Shared governance is the concept in which the parties that are part of an entity are going to be able to have a participatory role in the decision making. A participatory role would probably be defined as being able to speak and to vote. It certainly, but not necessarily, implies that they would have to have every vote go the way they wanted it to go. But, it would mean that they could have the opportunity to speak, debate, engage in dialogue, and to vote and through the process of speaking and voting be able to help shape and give character to the policies that are going to emerge out of the body. That is a brief description.

Senator Schramm: My second question, is that you made a reference to the fact that a past President had alienated the faculty constituency on the Senate. Have you ever taken into consideration the students in regard to the faculty?

Senator Tuttle: I spoke of a past president, many years ago. A colleague of mine in my discipline, who is no longer on this campus.

Senator Mohr: Senator Tuttle is referring to President Berlo. I can assure you that every move that he made came through the Academic Senate. I was chairman of the Academic Affairs Committee at the time and he nearly drove me crazy. But, he did not bypass the Senate. Usually they voted for him because he had a lot of clout. And you know that he and I seldom agreed.

(XXI-86) Roll call vote on Constitutional Amendment #2: failed. 9 yes; 26 no; 4 abstentions.

Senate recessed for fifteen minutes.

3. Student Representation by College

XXI-87 **Motion by Schramm (Second, Rendleman) to change:**

Article V., Academic Governance, Section 1. Academic Senate, B. Elections:

DELETE: 3. Undergraduate student representatives shall be elected by undergraduate students from units defined in the election rules.

ADD: 3. Undergraduate student representatives shall be elected by undergraduate students **from candidates nominated in proportion to the number of students enrolled in each College of the University. Each College shall have at least one representative on the Academic Senate. The Election Committee shall annually apportion seats among the colleges.**

Senator Schramm: I think this would be very progressive and not only lead to better representation on the Senate, but more viewpoints. I know there was concern at the last meeting about specifics and wording should be considered. I know some of you have questions on where would the students come from and how would it be done, etc. Specifics could be offered by members of the Senate themselves, the student elections committee, or through the elections code in the Constitution. With the undergraduate and graduate students who currently run for the Senate when they petition to get on the ballot for Senate they need 25 signatures of students at ISU. What they could do from now on, if this were to pass, is to get the signatures of two faculty members from the college they are applying to represent in addition to the 25 students' signatures.

There was a concern last week about getting nominations from faculty members. In this way the students would be actively involved with the faculty members in their college.

Another thing is that after the student submits his petition if validated, then they are pooled on their respective college list. An example would have a sub-heading: College of Arts and Sciences (choose six out of the following twenty candidates). College of Business (choose four out of the following fifteen). These proportions would be developed on current college enrollment levels. That is how it is right now. Obviously, the College of Arts and Sciences would retain more seats. I would like you to look at that list again. These are the candidates that are running for Academic Senate next year. Out of the 47 undergraduates on that list, 27 (57.4%) of them are from Arts & Sciences; 10 (21.2%) are from the College of Business; 6 (12.7%) are from the College of Education; and 4 or (8.5%) are from CAST. There are no members of the College of Fine Arts running for Senate seats for the coming year. For Graduate seats, two are from the College of Arts and Sciences and one is from the College of Business. With these stats, next year, it could be conceivable that our whole student population could come from the College of Arts and Sciences. I am a mathematics major and I would like to say that it is wrong that one college could dominate a whole constituency. It is alarming. Why? First of all, it does not offer varying viewpoints from different students. I think that is a problem right now. In the majors and the colleges they represent right now, there are too few different viewpoints. I think that by representing by college, it would increase interaction between students and faculty. Most importantly, from a student's standpoint it would give different students different ideas. We see a majority of College of Arts & Sciences or a College of Business perspective and we don't get to see the CAST and the College of Education or College of Fine Arts students' viewpoints. This proposed amendment would better represent the constituents of the students. It offers a different viewpoint. As a student in the College of Arts and Sciences and the College of Business, I don't get to see what the College of Fine Arts feel on different topics. It is important from the students' standpoint to change this. I would hope that the faculty and administrators could see the importance of getting students from a diverse group involved in the Senate.

Senator Rendleman: I support this constitutional amendment for what it will do between the faculty and student relationships. I am fortunate enough to have two faculty members on the Senate from whom I am presently taking classes. I identify with those senators a little bit easier than I do with some of you others. I feel like inside of class there is some sort of common interest that we can share and discuss and come and shape the policies of this University. Also, the specifics on wording such as Senator Schramm's hypothesis on how students would be elected and including two faculty signatures on peti-

tions, all that nitty gritty -- where do the undeclared majors go; where do the general studies majors go; all that can be worked out in the Elections Code. What is important is that the general concepts be included in the Constitution. The Constitution should include how your students are elected.

Senator Liedtke: While I am in whole hearted support of having representation by colleges, I am sadly disappointed that the recommendations that were made at the last Senate meeting were not taken and put into implementation on this particular petition. We see before us the same thing that we saw before. I am not prepared to support this without the nitty-gritty worked out for us. There is an awful lot of nitty-gritty that will have to be dealt with before this issue can be voted on by myself and my fellow senators. The issue of having college representation is very important. I do think that it is more important to have even representation across the colleges. We have students serving on a variety of committees, and if we have students being predominantly from the College of Arts and Sciences, we are not having even representation on committees and things of that nature. In that regard, I would not support this proposed amendment at this time.

Senator Rendleman: We could not change any of the wording because they were constitutional amendments that were put into the minutes. That was the reason. We did not ignore your suggestions.

Senator Walker: It is a scary thought. I sort of agree with Schramm. I disagree with Scott that this needs to be in the Constitution. If the wheel's not broke, don't fix it. We can alter it some through the appropriate committees and bring it back to the Senate for a vote. I would suggest that would be the most appropriate means. I support the concept, I think this is the wrong vehicle to get it done.

Senator Kagle: I would like to note that I only have one page of the Academic Senate Undergraduates. I notice that of the 47 candidates, there are 9 in Political Science; 4 in Purchasing; 5 in Finance; 5 in Elementary Education; (Correction -- PUR stands for Public Relations) -- the point is that simply dividing students by colleges is not enough. If we want diversity, it is important that we make some limits on the department level. The faculty can only have two representatives from each department. Some of these things need to be put into the Bylaws to delineate these things. On the other hand, I support the amendment, because whatever faults there are, are going to exist in the current system. Everything that I find lacking in this proposed amendment exists currently in the present system. At least this is a very modest step in the right direction. I think that by approving it, we would not only move in this direction, but we would give our passive endorsement toward the effort to make those changes outside the amendatory process that

we have talked about. These kinds of changes can be made to the system. We are not talking about the idea system. We are simply saying, is this proposal better than what we have now? I would say, yes, it seems to be better and certainly not inferior.

Senator Zeidenstein: Two points. They cannot be changed because as Senator Rendleman said you cannot change the wording. But, the wording is still flawed. It refers in the last sentence to "the election committee shall annually apportion seats among the colleges." Other references to the elections committee in the Constitution refer to the Faculty Elections Committee in the Blue Book of the Senate. As it happens, the Faculty Elections Committee has one member from each of the five colleges, and they apportion the faculty on the Senate. If this were to be passed as it is now, it seems to me that the apportionment would be done by the Faculty Elections Committee. Now I suppose they could go to the Provost and get data on the students. It is flawed the way it is, based on who you would want to do it. OK. Second point, I have heard several assertions coming from various sources. I can observe from my years on this body at different time periods, I can see no evidence to support assertions that the college orientation of student senators have influenced their policy judgements on the way they vote. I have heard a lot of talk that if you get students from different colleges, they will bring the orientation from their colleges -- I have not noticed that in the way the students vote. I haven't noticed that that much in the way faculty members vote. What I am saying is that the improvements some of my colleagues on this body think will come because of the fault of the current system are simply assumptions that are only supportable by wishes and hopes.

Senator Schramm: When it says the election committee in the Constitution; and then you say that the election committee refers to the Faculty Elections Committee in the Blue Book. That could easily be changed. This deals with the Constitution. An amendment to change the Blue Book could easily be made following passage of this amendment. The Faculty elections Committee would pertain to the Faculty Elections; while the student election could be supervised by the Student Code Elections Board.

Senator Zeidenstein: Are you saying that a new committee, created by this body, and therefore a creature of the Senate, because that is the only way it would occur in the Blue Book should allocate student seats shall also be a committee of the Senate and appear in the Blue Book? Is that what you are saying?

Senator Schramm: Pertaining to the student allotment, yes.

Senator Zeidenstein: Then, whatever current student elections committee would not be doing the apportionment, but a new student elections committee would be created by the Academic Senate.

Senator Schramm: That could be done. Or the current student elections code board that is currently in charge of running student elections, securing petitions, printing ballots, etc. that could be alloted to them.

Senator Zeidenstein: Then you come back to the Constitutional contradiction of naming one committee which translates into Faculty Elections Committee here. If the Constitution is going to be amended, it seems to me there ought to be a separate statement in the Constitution that should talk about a different elections committee for a different group of senators. Otherwise the constitution is going to raise all types of questions. You can't take one committee, the elections committee, and from that legitimately create two separate committees serving two separate bodies with two separate memberships. You could -- but it is not advisable.

Senator Schramm: We are talking about semantics here. It says the election committee in the Constitution. If this is approved, it says that the Faculty Elections Committee is in charge of appropriating seats, due to population. We are not striking the fact that in the Constitution it says that currently student seats are allotted by population due to total enrollment. That would remain. What I am saying is then, whoever might want to initiate this might add a change to the Blue Book to change the Faculty Elections Committee to be composed of two branches the Faculty Subcommittee to be in charge of apportioning faculty seats and the Student Subcommittee shall be in charge of apportioning student seats.

Senator Zeidenstein: Necessity is the mother of invention.

Senator Schramm: When you say you have heard that students have been voting the same. Scott and I as students know that we don't receive as many different perceptions from students to get the total picture of the entire University. We want to have the total student body represented on the Senate and have a chance to speak. Perhaps by securing students from the different colleges we could see how the different legislation affects the students in other colleges. The College of Fine Arts has not been represented on the Senate for several years by a student.

Senator Zeidenstein: Is there anything in the election of student government that is currently done on the basis of colleges?

Senator Schramm: It is required for any student official to put down their major.

Senator Zeidenstein: But they are not apportioned according to colleges or anything. There is no black-balling of only so many Political Science majors and no more. But in this body you suggest that we do something that you don't do on your own student government body?

Senator Rendleman: This body is distinct from any other student government body that we have.

Senator Schramm: Another thing is that the faculty are elected according to college and we think students should be.

Senator Goldstein: I am inclined to support this. I think a lot of faculty senators would. Do you still want us to support this, given the fact that it would turn over student elections to the Faculty Elections Committee? Wouldn't you rather have it re-written in more clear language?

Senator Schramm: Do you think that the Faculty Elections Committee would screw the students over? I have faith that an amendment to change the exact wording of the Blue Book as interpreted by the Constitution, I would feel that, yes, the student elections committee as it now exists would at least be developed into that elections committee, where student apportionments and seats would be developed by the students as the faculty elections committee is in charge of faculty.

Senator Goldstein: I appreciate your statement of trust. I think it would be better to state within the body of the amendment that it should be the student elections committee. It would make it more likely for the faculty to support this.

Senator Schramm: I will state on the record that I would hope that you still support this. I would hope that legislation would follow to alter the Blue Book interpretation of the elections committee out of mutual respect for both constituencies. I respect the faculty, and don't see that as a potential problem.

Senator Richardson: I will support the amendment, even though I realize it is flawed. My feeling is much the same as Senator Kagle. I realize that in past discussion there were a lot of questions about how you would accomplish this. This is a good step forward. I would hope, like in the College of Arts and Sciences where faculty are elected in sub-groups, that departments could be represented. I will vote for the amendment.

XXI-88 Senator Svoboda: I move the previous question. Second, Mowles. Motion carried by a 2/3 majority.

(XXI-87) Roll Call Vote on Amendment #3 failed: 31 yes; 5 no; 3 abstentions. It would need 34 votes to pass by an absolute majority.

Senator Kagle: Do abstentions count as a "no" vote?

Parliamentarian Cohen: That is correct. Once a constitutional amendment is voted on it is dead. It can be reintroduced in the future.

Senator Liedtke: I would like to change my vote. I thought we were voting on whether or not to cut off debate. I would like to change my vote for the record.

4. "The Vice Chairperson shall be a student representative."

XXI-89 **Motion by Schramm (Second, Rendleman) to change:**

Article V., Academic Governance, Section 1. Academic Senate, C. Officers.

DELETE: 1. .....The Chairperson and Secretary of the Senate shall be faculty representatives.

ADD: 1. .....The Chairperson and Secretary of the Senate shall be faculty representatives **while the Vice Chairperson shall be a student representative."**

Senator Rendleman: I will start this one because I am the Vice Chairperson and I have a vested interest in seeing this one passed. The Vice Chairperson's position serves as an information link to the rest of the students regarding academic policy proposals. I serve as an ex officio member of the Student Body Board of Directors. I am in a student leader position and sometimes asked to serve on various ad hoc committees that are formed. I think it is important that a student serve as the Vice Chairperson for it enables a student to gain a lot of information about the workings of this University. I don't think this a debate about whether the faculty are trying to punish the students, but that was a consideration last time. I can't imagine why the faculty would not want to have a student as Vice Chairperson. It was suggested to me earlier today that the student's might have a Vice Chair that would take the Senate business as a joke and make a mockery of the Senate. That might have been a consideration when this constitution was drawn up in the early 70's out at Starved Rock when students were considerably different than they are today. However, this body ought to be allowed to progress. The Vice Chairperson's position requires responsibility. A student would have to take on that responsibility. I can't imagine in any possible way that a student would take this position as a joke. If they did, the Senate has every right to impeach that person as Vice Chairperson. Does anyone have any good reason why the Vice Chairperson should not be a student?

Senator Zeidenstein: I don't know of any provisions in the ISU Constitution or the ISU Bylaws that provide for impeaching anyone. That is not an argument against the amendment. There is no such thing as impeachment of any Officer of the Executive Committee.

Senator Rendleman: You caught me on a technicality. I view that the Vice Chairperson shall be a student as a matter of respect to the students on the Senate. I am told that the faculty do respect the students on the senate, and most times I am inclined to believe that. However, I am having difficulty finding any evidence of any formal expression of that respect. I am told that it is a progressive step for students to serve on the Academic Senate that comes up with academic policy. Again, Starved Rock. It was a progressive constitution in the early 70's, but today it might be a bit outdated.

Senator Schramm: It has been proven that a student can hold this responsibility in the past. Another thing, it is about mutual respect. I would hope that the faculty here don't have the attitude of "If it's not broke, don't fix it." Because we aren't the ones who will be changing this. If this is passed, it will go to the Board of Regents for approval. It is an honor for a student to be selected as Vice Chair. In the aspect of shared governance and participating in the executive process, and also as my last thing on this Senate, that this will pass. It would be noteworthy and show that the student body is respected enough and trusted enough that a student could hold the responsibilities of this position.

Senator Tuttle: I am torn on this. I am compelled by Senator Rendleman's arguments. If I had the opportunity to name you Vice Chairperson forever, of the Senate, I would do so. I am compelled by your arguments, your character, and think you have been a fine Vice Chair of the Senate. You raised the question, can anyone think of a reason why we should not institutionalize what has been an understanding through the years. Again I have to draw on history. During the early 80's, in one caucus we had an instance where the individual that the students were going to select for the position of Vice Chairperson was one whose record on this campus was both academically and socially questionable. At which point, the faculty caucus let it be known that if that person was named by the students, the faculty would choose a faculty Vice Chair. The students changed their candidate. I feel that a student should occupy this position, and I would continue to feel that way, but I am aware of one instance where faculty could name a faculty Vice Chair if necessary. I would hope that a situation like that never arises again. I am really torn. The validity of your argument. However, I will have to vote against it.

Senator Zeidenstein: I don't believe that you should create constitutions and offices to fit whoever currently holds the office or is the current popular hero or politician. Current student qualifications are one thing, but we are talking five years or ten years down the line. The good come, the bad go. It should not be a matter of personalities. Secondly, a particular student which the faculty felt was a bad apple, did not get elected. As I read this amendment, "the Vice Chairperson shall be a student representative." That in itself does not say that the particular person chosen by the student caucus must be the person elected by the entire Academic Senate. It seems to me, since this body has always elected a student senator for Vice Chair, and with one exception has always elected the presumable first choice of the student caucus, what this does is no more than codify the practice. There is still enough of a faculty ratio on the Senate to vote against that person if the faculty were not happy with the nomination.

Senator Walker: Is this correct?

Parliamentarian Cohen: Absolutely. In one instance where a student senator was elected Vice Chair when the students had put forth one nomination; but the faculty caucus put forth another nomination. The faculty ignored the student caucus and nominated their own student. There has always been a student Vice Chair. There has never been a faculty Vice Chair.

Senator Walker: What about the statement about codifying what has always been? Does that make it a rule? (NO)

XXI-90 Senator Svoboda: I move the question. (Second, Kagle) Motion carried on a voice vote.

(XXI-89) Roll Call Vote on Amendment #4 passed: 36 yes; 2 abstentions.

COMMUNICATIONS

Senator Ritch: I would like to say to the students on Amendment #3, that I voted against it. However, I would encourage the students to re-think and re-word that. I supported the concept.

Senator Schramm: I wish the very best of luck to those remaining on the senate. I hope relations can improve. I know in the past I may not have been an aid, and may have said some things that might have caused polarization, however I think that this can be an outstanding body. I hope that innovative legislation, even amendments, will come forth from both the faculty and students in the future.

Senator Mohr: I was very please with the statement from Dr. Strand that the Administration was trying to carry out the guidelines passed by the Senate concerning the non-tenure track faculty. In relation to that, I distributed some data which refers to data from the Provost that actually was in requested by the Senate in those guidelines. I would like to comment on the data that I gave you. The raw data had some inconsistencies in it. They did not seem particularly flawed the body as it appeared to me, because most of the errors were in the area of 10% or 9% of students who were in Categories 5-11. 90.8% precisely. Headcounts that end up in fractions I don't understand. I didn't know we had so many handicapped students. I eliminated those categories in Table II. There was a Letter to the Editor of the Pantagraph today which stated that "By The Pantagraph's own figures, 34% of ISU faculty are temporaries; that is, not even allowed into the tenure system." The data in Table II show that full-time non-tenured faculty are 15.4% of the total university faculty, and part-time non-tenured are 17.1%. If you add those two together, it is 32.5%. You will also notice that part-time non-tenured faculty teach an average of 43 student seats (that is the people sitting in the classroom). I think the better figure would be student credit hours (multiply the student seats times the number of credit hours) would give us better productivity figures on how many people are taught by what classification of faculty. I would suggest that refinement of the data. I would think there would be some benefit in identifying level -- such as 100 level courses; 200 level courses, etc.; and class size. There are some very large classes that are sometimes taught by temporary faculty. As you will note, temporary faculty have much higher student seat load than non-tenured faculty. I just want you to understand that these data are useful. You can also use the data to test the accuracy of the statement in this letter that says: "Although temporary faculty are made to feel marginal to the life of the university, their functions are central to its mission; they teach required courses in core subjects, such as English composition, speech and mathematics -- not courses which are subject to fluctuation in enrollment, as David Strand claimed." You can check that statement, a fairly accurate statement, with this data. I give you the data, you can do with it as you like. I feel that since I told the Senate this data would be available, that I should provide it.

Senator Wallace: I have two points on the comments just made. First, there seems to be a correlation between the type of courses that we use non-tenure track faculty for and as we trace that through the average class size at ISU which is 24.5. We can break that down to university studies and major courses, we see that university studies is about 43; and major courses is about 18. My second point is that it would be helpful for the Senate committees to address this question, and perhaps have some conversation with chairs and deans about the strategies that are used in using non-tenure track faculty. What and why

some of these numbers are like this.

COMMITTEE REPORTS

ACADEMIC AFFAIRS COMMITTEE - Senator Taylor had no report.

ADMINISTRATIVE AFFAIRS COMMITTEE - Senator Richardson had no report.

BUDGET COMMITTEE - Senator Walker reported that his committee had submitted a written report to the Executive Committee and they had discussed this report. I will briefly communicate to you an oral report on our February 14, 1990, meeting with the President and Vice President Alexander. Several topics were discussed. One of which was FY 89 end of year excess money. Some of this money will go for academic remodeling in Schroeder Hall, and various laboratory equipment and the Temporary Office Complex used by CAST and the College of Arts and Science. The second topic was the Provost Emergency Fund. The President asked the Provost to keep an emergency fund for needed equipment purchases. Money in this fund could be borrowed by a College in any year to purchase equipment, but would then have to be repaid by the College during the next fiscal year. Another topic was the monies from the two-year tax increase. These funds ($2 million dollars) were spent for non-recurring items which would include such operational budgets as telecommunications, travel funds, equipment purchases, Library book acquisitions, awards, grants and contractual items. Another topic was Civil Service salaries. The University has worked out an agreement with Civil Service to make the Civil Service salaries more competitive with the local labor market. Over a three year period the salary scale maximum and minimum values will be increased. It should be noted that Academic/ Professional personnel salaries were not addressed in either the plan to increase faculty salaries or the plan to increase Civil Service salaries. Consequently, the University is currently conducting a review to address this issue. The next topic was the FY 91 budget. It was discussed as it pertains to the student enrollment and the budgeting process of the University. Regarding the relationship between decreasing enrollment and the total university income, ISU is negotiating with the IBHE to increase the total dollars coming from state appropriations as the tuition income decreases in the event that ISU decreases it enrollment. These negotiations, if successful, will diminish the likelihood of ISU receiving a lower income if student enrollment declines. President Wallace reports that some progress is being made on this issue. In summary, I would like to make the statement: "If the two year tax increase for education is not made permanent, the most likely result could be a $250 per year increase in tuition. This is truly a reflection of the seriousness of the funding for higher education." That is a summary of what was discussed in the Budget Committee Meeting. The full report is on file

in the Senate Office. The Budget Committee has requested that Vice President Alexander discuss with us the program consultants for various things that have gone on on campus, the total dollars spent, the total dollars planned for consultants, etc. He is going to try to respond to us in the near future on that.

FACULTY AFFAIRS COMMITTEE - Dr. Ritt had no report from Faculty Affairs Committee. They are aware of and have seen a questionnaire prepared by the University Review Committee regarding the ASPT system. Dr. Webb-Lupo stated that the questionnaire would be distributed to faculty members during the week of Spring Break.

Senator Walker: Are announcements going to precede this questionnaire so that faculty members will be aware of what it is and the importance of it?

Senator Ritt: The committee has not considered that. But I think it is a good suggestion.

Senator Walker: I think it should be so it could be announced at faculty meetings and the surveys are not pitched.

RULES COMMITTEE - Senator Newby announced a brief meeting following Senate adjournment.

STUDENT AFFAIRS COMMITTEE - Senator Schramm had no report.

XXI-91 Motion to adjourn by Senator Mowles (Second, Rendleman) carried on a voice vote.

Meeting of the Academic Senate adjourned at 9:44 p.m.

FOR THE ACADEMIC SENATE

JOHN B. FREED, SECRETARY

Date: 2/28/90 Volume No. XXI No. 12

NAME	ATTEN-DANCE	#1 MOTION # XXI-84	#2 MOTION # XXI-85	#3 MOTION #XXI-86	#4 MOTION #XXI-87	MOTION # XXI-89	MOTION #	VOICE VOTE MOTION #	VOICE VOTE Y	VOICE VOTE N
ALEXANDER	P	YES	YES		YES	YES		XXI-77	X	
ALSTRUM	P	NO	YES	NO	YES	ABS.		XXI-78 (TABLED)		
ANDREW	P	YES	YES	NO	YES	YES		XXI-79	X	
ARNOLD	P	---	---	---	---	---	---	XXI-80	X	
BELVILLE	P	YES	YES	ABST.	YES	YES		XXI-81	X	
EDWARDS	P	NO	YES	NO	YES	YES		XXI-82	X	
FISHER	P	YES	NO	YES	YES	YES		XXI-83	X	
FREED	P	NO	YES	NO	YES	YES		XXI-84*RC		X
GABER	P	YES	NO	YES	YES	YES		XXI-85*RC		X
GAMSKY	P	YES	YES	ABST.	YES	YES		XXI-86*RC		X
GIOVANI	P	YES	NO	YES	YES	YES		XXI-87*RC		X
GOLDSTEIN	P	NO	NO	NO	YES	YES		XXI-88	X	
GOULD	EXCUSED	---	---	---	---	---	---	XXI-89*RC	X	
GRITZMACHER	P	NO	YES	NO	YES	YES		XXI-90	X	
HALL	P	YES	NO	NO	YES	YES		XXI-91	X	
HARPER	P	YES	YES	YES	YES	YES				
HOFFER	P	YES	---	---	---	---	---			
JOB	EXCUSED	---	---	---	---	---	---			
JOHNSON	P	NO	YES	NO	YES	YES				
JURGEL	EXCUSED	---	---	---	---	---	---			
KAGLE	P	NO	YES	NO	YES	YES				
LIEDTKE	P	NO	YES	NO	YES- NO	YES				
MOHR	P	NO	YES	NO	ABST.	YES				
MOWLES	P	YES	YES	YES	ABST.	YES				
NELSEN	EXCUSED	---	---	---	---	---	---			
NEWBY	P	NO	YES	NO	YES	YES				
NICHOLAS	P	NO	NO	NO	YES	YES				
RAUCCI	P	YES	NO	YES	YES	YES				
RENDLEMAN	P	YES	NO	YES	YES	YES				
RICHARDSON	P	NO	YES	NO	YES	YES				
RITCH	P	NO	YES	NO	YES	YES				
RITT	P	NO	NO	NO	YES	YES				
SCHMALTZ	P	NO	YES	NO	NO	YES				
SCHRAMM	P	YES	NO	YES	YES	YES				
STEARNS	P	NO	NO	NO	NO	YES				
STEUBINGER	P	YES	NO	---	---	---	---			
STRAND	P	NO	YES	NO	YES	YES				
STRICKLAND	P	NO	NO	NO	---	---	---			
SVOBODA	P	YES	NO	YES	YES	YES				
TAYLOR	P	NO	YES	NO	YES	YES				
TUTTLE	P	NO	YES	NO	NO	YES				
VANCIL	P	YES	NO	ABST.	YES	YES				
VANDENEYNDEN	P	NO	YES	NO	YES	YES				
WALKER	P	NO	YES	NO	NO	YES				
WALLACE	P	ABSTAIN	ABSTAIN	ABSTAIN	ABSTAIN	ABSTAIN				
WHITACRE	P	NO	YES	NO	YES	---				
WILLIAMS	EXCUSED	---	---	---	---	---	---			
ZEIDENSTEIN	P	NO	YES	NO	NO	YES				
TOTALS		17 YES	26 YES	9 YES	31 YES	36 YES				
		24 NO	15 NO	26 NO	5 NO	2 ABS				
		1 ABS.	1 ABS.	4 ABS.	3 ABS.					
		FAILED	FAILED		FAILED					
			NOT		NOT 2/3					
					CORRECT					

30 YES
6 NO

JAN 22 1990

TO: Len Schmaltz, Chairperson
Academic Senate

FROM: Carroll A. Taylor CT
Academic Affairs Committee

DATE: January 22, 1990

RE: M.S. in Geohydrology

The Academic Affairs Committee has approved the proposal for Master of Science degree in Geohydrology, subject to an addendum which will be forwarded to you as soon as it is ready. Academic Affairs requests that this proposal be introduced as an information item to the Senate as soon as possible after the addendum is available.

Thank you!

1.22.90.3

Addendum to GEONEPR 2/12/90

FEB 12 1990

The Academic Affairs Committee requested information which would be useful in further consideration of the proposed program for an M.S. in Geohydrology.

Four questions encompass the areas of interest.
1) Could Geohydrology be an undergraduate major, rather than a graduate program?
2) Are geohydrologists (or hydrogeologists) needed in Illinois?
3) Do we duplicate an existing program at the University of Illinois?
4) Do we have the appropriate faculty?

Answers, including information from current professional publications and letters written by professionals in Illinois, are provided in the following pages.

Q: Could Geohydrology be an undergraduate major, rather than a graduate program?

A: No. Although an undergraduate may elect one or two courses (Groundwater Geology, Engineering Geology) to train for this subdiscipline, additional key courses (or extensive experience) are needed. This is demonstrated by:
1) Survey results published in The Professional Geologist (Jan. 1990), which relate that "the typical hydrogeologist works for a geoscientific or engineering consulting firm, has between 3 and 6 years of experience, holds a Masters degree, and earns between $31,501 to $36,500 as an annual base salary ..."
2) The most recent scientific "manpower "survey (North American Survey of Geoscientists, 1986) shows that 57% of practicing hydrogeologists and hydrologists have an M.S. degree and that another 21% have a Ph.D. degree
3) In verbal discussions with potential employers and with adjunct faculty of University of Illinois, concern was expressed that our graduates need the traditional undergraduate (broad-based) degree in Geology (endorsed by the American Institute of Professional Geologists) as a base upon which the specialty of Geohydrology as a graduate degree program can be acquired.
4) A review of 6 current publications (Table 1 attached) which reveals that employers look carefully at resumes for key courses and/or experience.

Experience is important, because many professionals have had to learn on the job certain skills and knowledge not generally available in course work. Our program incorporates a coherent package of coursework which removes or drastically reduces the need for experience to practice the profession effectively.

Only 4% of the job descriptions specified "B.S." with no mention of experience, and 7% specified "B.S. with experience." Experience without reference to degree was stated in 41% of the descriptions. B.S./M.S. or M.S. was required in 37% of the employment ads, and 11% required a Ph.D. (the latter primarily university positions).

Q: Are geohydrologists (or hydrogeologists) needed in Illinois?

A: Yes, as well as throughout the United States. Last spring, I was told by the National Water Well Association that they had completed a survey of employment opportunities and qualified graduates coming from U.S. colleges. The conclusion was that there were 10 openings for every qualified graduate.

2.12.90.1

Quoting from letters recently written about our proposed program--

> "With the addition of thousands of "super fund" and similar sites throughout the country posing contamination threats to or actually contaminating the land, groundwater sources (aquifers) and surface water, the need for expertise in evaluating and mitigating these sites is vital. Hundreds of jobs have opened in the past ten years particularly in Illinois and the Midwest requiring such expertise, both in the public and private sector." - John P. Kempton, Illinois State Geological Survey

> "My work in this field in the past 13 years has shown me that there is an extreme lack of qualified geo-hydrology professionals at all levels . . . Groundwater is a vital resource, especially in Illinois, and nationwide the public has indicated a strong backing of environmental and regulatory controls supporting development of ground water resources and protecting the quality of the existing sources" - Michael T. McCarrin, Manger Environmental Division, Engineers International (Westmont, IL).

Q: Do we duplicate an existing program at the University of Illinois?

A: No, neither in Geology nor Civil Engineering. See comparison in Table 2, attached. The ISU courses at 300 level are currently offered.

Q: Do We have the appropriate faculty?

A: Yes, as documented in memo of November 29, 1989, from Robert Corbett to Catherine Batsche, upon the basis of which Dr. Batsche sent a memo to Dr. Schmaltz (December 14, 1989) stating that the 1987-88 Academic Affairs Committee ". . . was satisfied with the curricular aspects of the proposal but identified two concerns:
1) the need for an additional faculty member with research experience and
2) the need for additional space to house the program. . . . both conditions have now been met."

In answer to a request for additional information about John Foster's qualifications in geohydrology, he has provided a summary statement (attached).

Respectfully submitted,

Robert G. Corbett

Robert G. Corbett
Chairperson, Geography-Geology

Publication	Minimum requirement	B.S. only	B.S. plus experience	B.S./M.S.	M.S. pfd or reqd	Ph.D. required	Unstated, but generally requiring experience
MISCO, Jan. 1990	2	1	3	2	0	8	
Waterwell Journal, Jan. 1990	0	0	0	0	0	5	
Geotimes, Jan. 1990	0	1	0	0	3	0	
Env. Science & Tech., Jan. 1990	0	1	6	2	0	1	
Gaea, Dec. 1989	0	0	0	0	2	0	
Env. Careers Bull., Dec. 11, 1989	0	0	4	0	0	5	
Total	2	3	13	4	5	19	
% of total	4%	7%	28%	9%	11%	41%	

Table 1. Currently advertised job descriptions in hydrogeology or geohydrology.

ISU Proposed Program	UI Civil Eng.	UI Geology
Groundwater Geology (360)	Groundwater (357)	Intro. Groundwater Hydrogeology (355) Hydrogeology (455)
Engineering Geology (362)	none	Principles of Engineering Geology (450)
Fluid Flow in Earth Materials (435)	none	none
Geochem. of Meteoric Waters (439)	none	none
Groundwater Devt and Resource Mgt. (444)	none	none
Geology of Waste Disposal (452)	*	none
Probl. in Environmental Geology (456)	none	Practice of Engineering Geology (451)
Seminar (488)	none	non-specific
Water Resources and Environmental Law	none	none

* CE 344, Solid Waste Management has minor overlap, inasmuch as it covers "sources, quantities, and characteristics of solid waste; effect of refuse on the environment; establishment and operation of collection and transportation systems, material recovery systems, energy recovery systems, and ultimate disposal systems."

UI Civil Engineering has one of eight specialty areas entitled "hydrosystems engineering," which emphasizes surface water systems design, and has only one course in groundwater.

Table 2. Comparison with programs at University of Illinois.

2-12-90 1

THE PROFESSIONAL GEOLOGIST

OFFICIAL PUBLICATION OF THE AMERICAN INSTITUTE OF PROFESSIONAL GEOLOGISTS

1963 COMPETENCE INTEGRITY ETHICS 1990

VOLUME 27, NUMBER 1 JANUARY 1990

NWWA Survey Reports Salaries and Other Profile Data

The typical hydrogeologist works for a geoscientific or engineering consulting firm, has between 3 to 6 years of experience, holds a Masters degree, and earns between $31,501 to $36,500 as an annual base salary, according to the results of an August 1989 survey of randomly selected members of the Association of Ground Water Scientist and Engineers (AGWSE).

The study of all ground-water employment categories, including hydrogeologists, found:

- 79 percent were males;
- 68 percent were between 25 and 39 years of age;
- 41 percent held Masters degrees;
- 40 percent worked for geoscientific consulting firms;
- 40 percent were at the "senior professional" level;
- 43 percent planned to apply for the Certified Ground Water Professional designation;
- 36 percent spend between 61 to 80 percent of their jobs doing desk-work;
- 72 percent spend less than 21 percent of their jobs on water supply work;
- 43 percent spend more than 81 percent of their jobs on ground-water contamination work; and
- 60 percent have employees reporting to them.

Survey participants share a positive attitude about their careers and the future of their professions.

Fifty-six percent were "very pleased" about their ground-water employment, 62 percent indicated they were "very confident" about the future of the ground-water professions, and 87 percent said they were "looking forward to a long career in ground water."

Employment opportunities in ground water over the next 5 years also look promising. Twenty-two percent of the study respondents said employment opportunities with their current employer will "expand strongly." Fifty percent said they would "expand moderately."

The results of the study, "SURVEY 89: THE GROUND WATER PROFESSIONS," are available from the National Water Well Association Bookstore, P.O. Box 182039, Dept. 017, Columbus, OH 43218, for $31.25 ($25 to NWWA members).

Illinois State Geological Survey

Natural Resources Building
615 East Peabody Drive
Champaign, IL 61820
217/333-4747
FAX 217/244-7004

ENR
Illinois Department of
Energy and Natural Resources

January 29, 1990

To whom it may concern:

I have recently had the opportunity to review the proposed curriculum for an M.S. program in Geology at Illinois State University, directed specifically for training students for employment in the areas of water resource development and management, groundwater protection and related environmental problems. This field, referred to as Geohydrology or Hydrogeology depending on the specific focus, is, according to recent studies and my own experience, one of the most rapidly growing both in terms of need and employment opportunities. With the identification of thousands of "superfund" and similar sites throughout the country posing contamination threats to or actually contaminating the land, groundwater sources (aquifers) and surface water, the need for expertise in evaluating and mitigating these sites is vital. Hundreds of jobs have opened in the past ten years particularly in Illinois and the Midwest requiring such expertise, both in the public and private sector. At the present time many consulting firms and government agencies, both research and regulatory, are looking for perspective employees well trained to handle waste disposal and water resources related issues in particular. It is anticipated that this need will carry far into the future, given the magnitude of the problem and the importance of our water resources and the demand for establishment or clean-up of waste disposal sites.

It is with this view in mind I heartily endorse the concept of developing a masters degree program geared to training qualified, serious and interested students in the applied areas of hydrogeology and geohydrology and the related areas of engineering geology, geophysics and geochemistry that will qualify them for meaningful employment in these fields. In view of the need, it is timely that such a program is proposed. To my knowledge there are few if any universities focusing specifically on training students specifically for such jobs. Most University programs are more research oriented or tend to provide more general training in applied geology or hydrology. That approach is more likely to let the student select his or her area of concentration and may or may not provide the skills necessary for immediate employment.

Based on the history Illinois State University has of providing excellent training for teachers and other professionals, the proposed M.S. program appears to fit perfectly. Further I believe the existing geology faculty (and positions proposed) fit this program well. I have been directly acquainted with faculty members and students and the geology program of the Department of Geography-Geology of the University for more than 10 years. The Illinois State Geological Survey has employed students that have graduated from the ISU

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geology program, one faculty member is a research affiliate of the ISGS and I personally have participated with research projects with ISU staff members. Several of the geology faculty have had significant experience in consulting and service activities that along with their basic knowledge of geology, hydrology and other related applied areas, proves a core of expertise to support the offering of such a masters program.

My nearly 34 years at the Illinois Geological Survey, mainly in research and service in ground water geology and environmental geology, including site studies, has given me an opportunity to see the urgent need for more well trained, focused individuals to address the critical issues of groundwater protection and resource development. I therefore urge that the development of an M.S. program focused on Geohydrology and Hydrogeology be given the most serious consideration and support.

Sincerely,

John P. Kempton
Geology and Head
Quaternary Framework Studies Section

JPK:gmg

2.12.90.1

FEB 12 1990

98 East Naperville Road, Suite 101
Westmont, IL 60559-1595

ENGINEERS INTERNATIONAL, INC.

Telephone: 708/963-3460
Facsimile: 708/968-6884
Telex: 280102 ICO OAKR
Cable: ENGINT

25 January 1990
Ref. No. 99-05

Illinois State University
College of Arts and Sciences
Department of Geography -
Geology, Schroeder V206
Normal, IL 61761-6901

Dear Dr. Robert Corbett:

I would like to take this opportunity to introduce myself and to open a discussion with you regarding the establishment of a graduate geohydrology program at ISU. My name is Michael T. McCarrin and I graduated from ISU (Geology) in 1976. My early years away from ISU saw me employed at the IEPA. Subsequently, I worked with a large consulting firm on USEPA contracts, and, currently I am the Environmental Division Manager at Engineers International, Inc. (EI), an independent engineering firm.

Most of my professional career has been involved with environmental studies specifically hydrogeology, hydrology, and geological evaluations. Much of my experience and training in this area has come through work experience and post graduate studies. My work in this field in the past 13 years has shown me that there is an extreme lack of qualified geo-hydrology professional at all levels. The industry has been strong especially in support of the environmental consciousness prevalent in the public today. Ground water is a vital resource especially in Illinois, and nationwide the public has indicated a strong backing of environmental and regulatory controls supporting development of ground water resources and protecting the quality of the existing resources.

Over the past several years, I have kept in contact with the geology staff at ISU and have actively pursued hiring ISU geology graduates. I have additionally been very interested in the development of a geo-hydrology program at ISU to help meet my staffing needs in the future. ISU has a unique and timely opportunity to provide the

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industry with these specialists. As usual, ISU's Geology Department is at the forefront of supplying critically needed scientists for today's needs.

I wholeheartedly support your attempt to implement a geohydrology graduate program at ISU. If I can be of assistance, please let me know.

Sincerely,

ENGINEERS INTERNATIONAL, INC.

Michael T. McCarrin
Manager Environmental Division

MTM/ds

Illinois State Geological Survey

ENR
Illinois Department of
Energy and Natural Resources

Natural Resources Building
615 East Peabody Drive
Champaign, IL 61820
217/333-4747
FAX 217/244-7004

January 29, 1990

The Academic Senate
Illinois State University
Normal, IL 61761

To whom it may concern:

I was asked by Dr. Robert G. Corbett, Chairman of the Department of Geography-Geology, to comment on the proposed graduate program leading to a Master of Science degree in Hydrogeology. The study of Hydrogeology is concerned with the occurrence of water within the earth's lithosphere, the movement of water through the geologic media, the interaction of the water with geologic media and other fluids, the interaction of ground water with the land surface, and other geologic processes related to ground water. The theoretical base leads to numerous practical applications of the science: for example, water resource development, ground-water chemistry, protection and rehabilitation of ground-water quality, and the role of ground water in geologic hazards and waste disposal.

I have reviewed the curriculum and the descriptions of the required courses. It appears to me that the course of study provides a balance between theoretical background and the application of hydrogeology to today's issues.

Hydrogeologists are in great demand in today's job market. This demand is in large part driven by environmental regulations. Hydrogeologists are in demand by Federal, State, and even local governments. The regulated community has an even greater need for hydrogeologists. Consulting companies, large and small, as well as many corporations are continually looking for qualified hydrogeologists. Unfortunately, the need for trained hydrogeologists is far greater than the supply. In my experience well-trained students are in great demand. The unfortunate part is, that there are so few well-trained hydrogeologists, that many poorly trained and unqualified persons are trying to "ride the environmental bandwagon."

I compliment Illinois State University for acting to fill the needs of modern society for well-trained hydrogeologists.

Very truly yours,

Keros Cartwright
Principal Geologist and Head
Hydrogeology Research Laboratory
Adjunct Professor
University of Illinois

KC:gmg

2.12.90.1

CREDENTIALS OF PROF. JOHN FOSTER, SPECIFIC TO THE GEONEPR

SUMMARY STATEMENT OF 34 YEARS APPLIED EXPERIENCE, 1948-1982
(PRIOR TO ARRIVAL AT ISU)

---- Approx. 800 geohydrological investigations with a range of nearly every geological-geographical circumstance.

---- Domestic research in Illinois, Texas, So. Carolina, Mississippi, No. Dakota, New Mexico, Kansas, Nebraska, Alabama, Georgia, Nevada, Arizona, New Hampshire, New York, Virginia, Hawaii, Utah, Minnesota, Florida, California, Missouri, Oklahoma and lesser studies elsewhere.

---- Foreign research in Canada, Mexico, Jamaica, Kuwait, Jordan, Lebanon, Saudi Arabia, Syria, Ahfganistan, Cyprus, Thailand, Pilippines, Spain, Great Britain, Sudan, Ethiopia, Tunisia, Libya, U.A.E., Bahrain, Iran, Egypt and lesser studies elsewhere.

---- Major clients for whom work undertaken:

United States Air Force
City of Los Angeles
So. Calif. Water Company
Henry J. Kaiser
Bechtel Corporation
U.S. Agency for International Dev.
International Engineering Ltd.
HDR Energy Development Corp.
International Aviation Organization
City of Las Vegas
and ministries of a dozen countries.

Kimberly-Clark Corp.
Kern County Land Co.
Los Angeles County
United Nations
Ralph M. Parsons Co.
Litton Industries
General Lacey Murrow
Aswan High Dam Authority
ARAMCO

---- Project Manager appointments with total constructed value in excess of 400 million dollars.

---- Rate of publication authorship: approximately one per year for the period 1951 through 1989, including sole author of U.S. Patent 4,223,729 and joint author of U.S. Patent 4,807,201, rights to which transferred to ISU, 1989.

JWF
Feb. 12, 1990

2.12.90.1

Illinois State University
College of Business
Department of Finance and Law

April 14, 1988

To: 1988-89 Academic Affairs Committee

From: 1987-88 Academic Affairs Committee

Re: M.S. in Geohydrology

During the past year, the Academic Affairs committee considered the proposal for a new masters' degree program in geohydrology. After reviewing the proposal, our committee requested revisions in the explanation of and rationale for the program. We also expressed some reservations about whether the research record of the current faculty was strong enough to win approval of the program by the Senate and by external governing bodies. (For details, see memo to John Foster dated September 25, 1987.) At the same time, the budget committee expressed reservations about the availability of the laboratory space needed to implement the program.

Dr. John Foster, the faculty member who wrote the proposal, was most cooperative and prompt in incorporating the requested revisions in the narrative of the proposal. The problematic issue remaining is the ability to find the necessary resources to supplement the research faculty and to provide the necessary space and equipment. Dean Owen and Provost Strand hope to resolve some of these issues by fall, 1988. (See memo from Dr. Batsche dated January 13, 1988.)

Once the resource issues are addressed, the Academic Affairs committee will be asked to approve and submit the proposal to the Senate. As committee members who worked with Dr. Foster, we want to assure you of our support for the program, and that we were willing to recommend the program for Senate approval on the basis of its academic merit. We hope that you will consider our support when you review the proposal, and that you will recognize the work Dr. Foster has performed in revising the proposal to meet our requests. We hope that you will be able to minimize the paperwork he must perform before adding your stamp of approval.

If you wish more information about our views and actions, we will be happy to discuss them with members of the new committee. Thank you.

cc: Dr. Batsche

Normal-Bloomington, Illinois
Phone: 309/438-5675

328 Williams Hall
Normal, Illinois 61761-6901

Illinois State University
Vice President for Business and Finance

TO: Members of the Academic Affairs Committee

FROM: Richard Runner
Assistant Vice President for Physical Planning
& Operations

DATE: December 7, 1989

RE: Space for Geohydrology NEPR

During the 1987-88 academic year the Department of Geography/Geology proposed the establishment of a M.S. in Geohydrology. At the time of the NEPR submission no possibilities existed to provide the space required for the new program. Hence, the Academic Affairs Committee decided to postpone approval of the program until the University was in a better position to consider the space requirements of the program.

Since the original submission of the NEPR several facilities projects have been initiated. As a result the possibility now exists to begin planning for the space needs of the proposed program. The purpose of this memo is to inform you that our office plans to incorporate the space needs for the M.S. in Geohydrology in its planning documents. It is likely that space will come available for the program within the next three years. It is my understanding that this time line will coincide with the approval and implementation time line of the new program.

sq
cc: John Sigle

Normal-Bloomington, Illinois
Phone: 309/438-2143

Hovey Hall 302
Normal, Illinois 61761-6901

Illinois State University
College of Arts and Sciences
Department of Geography-Geology

MEMORANDUM

TO: Catherine Batsche
FROM: Robert Corbett RAC
DATE: November 29, 1989
SUBJECT: M.S. in Geohydrology

We are pleased and grateful for movement on the GEONEPR. Julie Gowen has asked that I respond directly to your memo of November 20, 1989.

The faculty available to support the program are:

CONTINUING	NEW
John Foster	Robert Corbett
James Kirchner	James Day
Robert Nelson	
Thomas Searight	

Dr. Hart has retired

Attached to this memo are resumes (prepared for the Geology Program review) for Robert Corbett, Chairperson and the geologist who will teach "Geochemistry of Meteoric Waters", and James Day, the replacement for Richard Hart.

Also, arranged in alphabetical order, are resumes of continuing faculty (prepared for the Geology Program review). I have placed a heavy vertical line in the left hand margin by significant items not appearing on the curriculum vita submitted as an addendum for GEONEPR.

Please call if further detail would be useful.

cc: Julie Gowan

Normal-Bloomington, Illinois
Phone: 309/438-7649

Schroeder 206
Normal, Illinois 61761-6901

NEW FACULTY:

ROBERT G. CORBETT

JAMES E. DAY

CONTINUING FACULTY:

JOHN W. FOSTER

JAMES G. KIRCHNER

ROBERT S. NELSON

THOMAS K. SEARIGHT

Black vertical lines in left margin call attention to items not listed in 1987 submission

1. NAME: **Robert G. Corbett**

2. INITIAL DATE OF EMPLOYMENT AT ISU: August, 1989

3. DEGREES/CERTIFICATES (including dates, degree granting institution and field of study): B.S. University of Michigan 1958
   M.S. University of Michigan 1959
   Ph.D. University of Michigan 1964
   Field: Geology

4. CURRENT AREA(S) OF SPECIALIZATION: Geochemistry of Natural Waters
   Economic Geology

5. TEACHING ASSIGNMENT, ISU: Insight into the Natural Sciences
   Introduction to Geology I

6. MAJOR SERVICE ACTIVITIES AND ASSIGNMENTS, ISU: Chairperson, Geography-Geology

7. PUBLICATIONS AND OTHER CREATIVE ACTIVITIES (indicate if refereed journal, juried exhibit, etc.)

Books:

Gable, D. J., Burford A. E., and Corbett, R. G., 1988. Precambrian Geology of Casper Mountain, Wyoming: U.S. Geological Survey Professional Paper, no. 1460, 50 p.

Journal Articles:

Corbett, Robert G., and Manner, Barbara M., 1984. Flouride in the ground water of northeastern Ohio: Ground Water, v. 22, no. 1, p. 13-17.

Manner, Barbara M., Lee, Raymond F., and Corbett, Robert G., 1985. Retrospective assessment of a potential cadmium hazard: Ohio Journal of Science, v. 85, no. 1, p. 12-16.

Corbett, Robert G., Manner, Barbara M., and Tompkins, Frank G., 1985. Using FORTRAN program to facilitate understanding of water chemistry with Piper diagrams: Journal of Geologic Education, v. 33, p. 171-174.

Beyke, Robert J., and Corbett, Robert G., 1986. Urea, nitrate, and potential water pollution from de-icing airport runways: Proceedings of the Seventh Annual Water Resources Symposium of the Indiana Water Resources Association, p. 197-208.

Corbett, Robert G., and Quick, Thomas J., 1986. Battery-powered field filtration assembly using an inexpensive mini-compressor: Journal of Geologic Education, v. 34, p. 196-197.

Corbett, Robert G., and Manner, Barbara M., 1988. Geology and Habitats of the Cuyahoga Valley National Recreation Area, Ohio: Ohio Journal of Science, v. 88, no. 1, p. 40-47.

Blount, A. M., Nelridge, R. A., and Corbett, R. G., 1989. Chloritization of dolostone: possible source of silica for talc formation: Southeastern Geology, v. 29, no. 4, p. 195-209.

Corbett, Robert G., 1989. Field trip guidebooks need not be gray literature: Geoscience Information Society Proceedings, v. 19, p. 113-122.

Papers Presented at Professional Meetings:

Corbett, Robert G., Lee, Raymond F., and Manner, Barbara M., 1984. Retrospective Assessment of a Potential Cadmium Hazard. Geol. Soc. America, Abstracts with Programs, v. 16, no. 3, p. 130. Presented at Lexington, KY.

Corbett, Robert G., Tompkins, F. G., and Manner, Barbara M., 1984. The Piper Diagram: under-utilized tool for illustrating the concept of natural waters as chemical agents. Geol. Soc. America, Abstracts with Programs, v. 16, no. 6, p. 477. Presented at Reno, Nevada.

Corbett, Robert G., Friberg, LaVerne M., Muller, Albert J., and Wingard, Paul S., 1985. Sandpaper Surface at the Superface of the Mowry Shale, Natrona County, Wyoming. Geol. Soc. America, Abstracts with Programs, v. 17, no. 4, p. 214. Presented at Boise, Idaho.

Bahr, Tim J., and Corbett, Robert G., 1985. Formation of Sodium Bicarbonate Ground Water and the effect on Fluoride Solubility. Geol. Soc. America, Abstracts with Programs, v. 17, no. 7, p. 517. Presented at Orlando, Florida.

Corbett, Robert G., and Quick, Thomas J., 1985. Conversion of a Mini-compressor for use in Field Filtration. Geol. Soc. America, Abstracts with Programs, v. 17, no. 7, p. 553. Presented at Orlando, Florida.

Beyke, Robert J., and Corbett, Robert G., 1986. Urea, Nitrate, and Potential Water Pollution From De-icing Airport Runways: Seventh Annual Symposium of the Indiana Water Resources Association, presented at Angola, Indiana.

Beyke, Robert J., and Corbett, Robert G., 1986. Urea Decomposition and Environmental Implications for De-icing of Airport Runways: Geol. Soc. America, Abstracts with Programs, v. 18, no. 4, p. 280. Presented at Kent, Ohio.

Manner, Barbara M., Corbett, Robert G., Gloeckler, Emily F., and Quick, Thomas J., 1986. Nested, two-generation ferruginous concretions from the Morrison Formation, Natrona County, Wyoming. Geol. Soc. America, Abstracts with Programs, v. 18, no. 4, p. 315. Presented at Kent, Ohio.

Auker, Karla M., Burford, Arthur E., and Corbett, Robert G., 1987. Systematic Variation in Brine Composition of the Northwest Flank of the Appalachian Basin: Geol. Soc. America, Abstracts with Programs, v. 19, no. 1, p. 3. Presented at Pittsburgh, Pennsylvania.

Corbett, Robert G., Manner, Barbara M., and Quick, Thomas J., 1988. Public Lands and the Teaching of Geology: Videotaping as a Practical Alternative to Taking Students Into the Field: Geol. Soc. America, Abstracts with Programs, v. 20, no. 5, p. 340-341. Presented at Akron, Ohio.

Corbett, Robert G., Deppisch, Vicki L., and Quick, Thomas J., 1988. Dissolved Organics in Oilfield Brine: Use of data determines sampling point: Geol. Soc. America, Abstracts with Programs, v. 20, no. 5, p. 340. Presented at Akron, Ohio.

Auker, Karla M., Billman, Thomas A., Burford, Arthur E., Corbett, Robert G., Wilk, Grant, B., and Quick, Thomas J., 1988. Variation in brine composition within two producing fields, "Clinton" Formation, Eastern Ohio: Geol. Soc. America, Abstracts with Programs, v. 20, no. 5, p. 322. Presented at Akron, Ohio.

Quick, Thomas J., Corbett, Robert G., and Manner, Barbara M., 1988. Miniaturized spectrophotometer permits chemical analysis in the field: Geol. Soc. of America Abstracts with Programs, v. 20, no. 7, p. 338-339. Presented at Denver, Colorado.

Corbett, Robert G., 1988. Field trip guidebooks need not be gray literature: Geol. Soc. of America Abstracts with Programs, v. 20, no. 7. Presented at Denver, Colorado.

Corbett, Robert G., Deppisch, Vicki L., and Quick, Thomas J., 1989. Decrease in dissolved organics in brine from well head to road surface: Geol. Soc. of America Abstracts with Programs, v. 21, no. 4, p. A-8. Presented at South Bend, Indiana.

Quick, Thomas J., Corbett, Robert G., and Manner, Barbara M., 1989. Efflorescent minerals occurring in the gorge of the Grand Canyon: Geol. Soc. of America Abstracts with Programs, v. 21, no. 4, p. A-44. Presented at South Bend, Indiana.

Corbett, Robert G., Manner, Barbara M., and Quick, Thomas J., 1989. Seeps and efflorescent minerals in the Grand Canyon: predicted vs. identified phases: Geol. Soc. of America Abstracts with Programs, v. 21, no. 4, p. A-8. Presented at South Bend, Indiana.

Corbett, Robert G., and Dannemiller, Gary T., 1989. Applications of variations in brine chemistry to basin analysis: examples from the Michigan and Appalachian basins: Michigan: Its Geology and Geologic Resources, p. 10-11. Presented at Lansing, Michigan.

Corbett, Robert G., Manner, Barbara M., and Quick, Thomas J., 1989. The growing crisis in geo(science) education: reaching the best of high school sophomores and juniors: Geol. Sci. of American Abstracts with Programs, v. 21, no. 6, p. A-356. Presented at St. Louis Missouri.

Shows, Exhibits, Performances, Translations, Book Reviews: None

8. GRANT AWARDS (internal and external funding support)

Ohio Department of Natural Resources Division of Oil and Gas, study of dissolved organics in brines, 1988-89
Geology Program, Governor's Summer Institute for Gifted and Talented Students, 1986, 1987, 1988, 1989.
Terex Corporation, equipment grant for portable seismographs, 1987.
Ohio Department of Natural Resources, determining the composition of selected natural waters, 1984-85.
Amoco Foundation Award (with L.M. Friberg) to purchase a high vacuum evaporator, 1984.
Argonne National Laboratory, participation in the Environmental Control Technology Survey, 1976-79.

9. PROFESSIONAL HONORS, AWARDS AND DISTINCTIONS:

Society of Sigma Xi (past-president, Akron Chapter, national delegate, Newsletter Editor).
Certified Professional Geological Scientist (#4502)

10. PROFESSIONAL MEMBERSHIPS (indicate offices held or other significant participation):

American Institute of Professional Geologists,
On-site evaluation team (undergraduate geology departments)
Association of Ground Water Scientists and Engineers
Geological Society of America (Field Trip Chairman, N-C Section 1988 Meetings)
Mineralogical Society of America
National Academy of Sciences/National
Research Council, U.S. National Committee for Geochemistry,
Member of Panel 13/38.4 on the Geochemistry of Water in Relation to Cardiovascular Diseases
National Association of Geology Teachers (past-president of East-Central Section)
National Institutes of Health
Member, Site Review Team (Cancer and Water Quality)
Ohio Academy of Science (Special Issue Editor, March, 1988, issue of Ohio Journal of Science)

11. PROFESSIONAL ACTIVITIES OFF CAMPUS:

Consultant to: Aetna Insurance Companies
Animal Welfare League of Summit County
Argonne National Laboratories
Baker, Messkison, and Dublicker, Canton, Ohio
Buckingham, Doolitle and Burroughs, Akron, Ohio
City of Norton, Ohio
Cornwell Quality Tools, Inc., Magadore, Ohio
Dome Petroleum Corporation
Joseph Svete, Esq., Chardon, Ohio
Keffler and Rose, Inc., Minerva, Ohio
Northfield Township (Ohio) Trustees
Ohio Department of Natural Resources, Columbus, Ohio
Park-Ohio Industries

Perry Township (Ohio) Trustees
PPG Industries, Barberton, Ohio
Ricerca, Inc., Painesville, Ohio
Steven Edwards, Esq., Columbus, Ohio

12. OTHER RELEVANT ACTIVITIES:

National Graduate University Courses on Principles of Grant and Contract Negotiation and Administration
American Geological Institute Short Course Geowriting

1. NAME: **James Edgar Day II**

2. INITIAL DATE OF EMPLOYMENT AT ISU: August 18, 1989

3. DEGREES/CERTIFICATES (including dates, degree granting institution and field of study): B.S. Oregon State University 1979
   M.S. Northern Arizona University 1984
   Ph.D. University of Iowa 1988
   Field: Geology

4. CURRENT AREA(S) OF SPECIALIZATION: Stratigraphy, Paleoceanography, Invertebrate Paleontology, Biostratigraphy

5. TEACHING ASSIGNMENT, ISU: Introduction to Geology I, Oceanography, Life of the Geologic Past, Invertebrate Paleontology

6. MAJOR SERVICE ACTIVITIES AND ASSIGNMENTS, ISU:

   Department Awards Committee
   Geology Club Faculty Advisor

7. PUBLICATIONS AND OTHER CREATIVE ACTIVITIES (indicate if refereed journal, juried exhibit, etc.)

   Books:

   Day, J. 1989. The brachiopod faunas and biostratigraphy of the Coralville and Lithograph City formations in eastern Iowa, G.S.I. Guidebook 51, in press.

   Day, J. 1986. Brachiopod fauna of the Lithograph City Formation of north-central and eastern Iowa, Geological Society of Iowa Guidebook 44: 14-22.

   Journal Articles:

   Day, J. 1989. The Upper Devonian (Frasnian) conodont succession in the Lime Creek Formation of north-central Iowa: Journal of Paleontology.

   Day, J. 1988. The brachiopod succession of the late Givetian and Frasnian of Iowa. In McMillian, N. J., Embry, A.F., and Glass, D. J., eds., Devonian of the World: Canadian Association of Petroleum Geologists Memoir, 14, 3:303-325.

   Day, J. 1987. Revision, distribution, and extinction of the Middle and early Upper Devonian gastropod genera Floyda and Turbonopsis: Journal of Paleontology, 61:960-974.

   Papers Presented at Professional Meetings:

   Day, J. 1989. Biostratigraphy of the Middle and Upper Devonian Strata (Givetian & Frasnian) of south-central New Mexico. Program and Abstracts of the 1989 National Meeting of the Geological Society of America, St. Louis, Missouri.

Day, J. 1989. Upper Devonian (Frasnian) conodont biostratigraphy of the Lime Creek Formation of north-central Iowa. Abstracts of the North-Central Section Meeting, Geological Society of America, p. 9.

Day, J. 1988. Conodont fauna and biostratigraphy of the Upper Devonian (late Frasnian) Lime Creek Formation of north-central Iowa. Program Abstracts, 100th Session of the Iowa Academy of Science, Iowa State University Journal of the I.A.S., 95: centerfold insert.

Day, J. 1987. Fauna and biostratigraphy of the Juniper Hill Member of the Lime Creek Formation (late Frasnian) of north-central Iowa. Program and Abstracts, 99th session of the I.A.S., Grinnell College, Grinnell, Iowa.

Day, J. 1987. Brachiopod extinctions and the Frasnian-Famennian crisis in the Early Late Devonian of southern New Mexico. Second International Symposium on the Devonian System, Program and Abstracts, p. 66.

Day, J. 1987. The brachiopod succession in the late Givetian-Frasnian of Iowa, a preliminary overview. Second International Symposium on the Devonian System, Program and Abstracts, p. 67.

Day, J., and Beus, S. S. 1987. Paleocommunities of the Jerome Member of the Martin Formation, Central and Southern Arizona. Second International Symposium on the Devonian System, Program and Abstracts, p. 68.

Day, J., Witzke, B. J., and Bunker, B. J. 1986. Stratigraphy and paleontology of the upper Cedar Valley Formation in northern Iowa. Program and Abstracts, 98th session of the I.A.S., Wartburg College, Waverly, Iowa. Proceedings of the Iowa Academy of Science, 93.

8. GRANT AWARDS (internal and external funding support)

Kansas Geological Survey: in support of subsurface geologic investigations, Kansas and southeast Nebraska, 1989, $1500.
Nebraska Geological Survey: in support of subsurface geological investigations, southeastern Nebraska, 1989, $500.
Geological Survey Bureau-Iowa Dept. Nat. Resources: in support of studies of Devonian rocks, north-central Iowa, 1988, $300.
New Mexico Bureau of Mines: in support of studies of Devonian rocks, San Andres Mountains, New Mexico, 1984, $3300.
New Mexico Bureau of Mines: in support of studies of Devonian rocks, Sacramento Mountains, New Mexico, 1983, $3000.

9. PROFESSIONAL HONORS, AWARDS AND DISTINCTIONS:

Honorary Membership Society of Economic Paleontologists and Mineralogists, Pacific Section Student Awards Program.

10. PROFESSIONAL MEMBERSHIPS (indicate offices held or other significant participation):

Society of Economic Paleontologists and Mineralogists, Paleontological Society, International Paleontological Association, Paleontological Association, Geological Society of Iowa, Iowa Academy of Science

11. PROFESSIONAL ACTIVITIES OFF CAMPUS:

Ongoing cooperative geologic investigations with staff members of the Iowa, Kansas, Missouri, and Nebraska Geological surveys.

12. OTHER RELEVANT ACTIVITIES:

Technical Editor for the journal "Kirtlandia": (Cleveland Museum of Natural History).

1. NAME: **John W. Foster**

2. INITIAL DATE OF EMPLOYMENT AT ISU: August 16, 1982

3. DEGREES/CERTIFICATES (including dates, degree-granting institution and field of study): A. B. Dartmouth College 1947
M. S. The Ohio State University 1950
Field: Geology and Mining Engineering

4. CURRENT AREA(S) OF SPECIALIZATION: Geohydrology, engineering geology, exploration, aquifer analysis, geothermal energy (HDR), geophysical logging

5. TEACHING ASSIGNMENT, ISU: Introductory Physical Geology
Groundwater Geology
Engineering Geology
Geophysics
Insights into the Natural Sciences

6. MAJOR SERVICE ACTIVITIES AND ASSIGNMENTS, ISU:

Acting Chairperson, Fall semester 1987 and academic year 1988-89
Trustee, The Ohio River Basin Consortium for Research and Education 1985-present
University's Student Code Enforcement Board, 1986-89
University Review Committee, 1989-present
College Research Committee, 1986-88
College Science-Technology Committee, 1985-87

7. PUBLICATIONS AND OTHER CREATIVE ACTIVITIES (indicate if referred journal, juried exhibit, etc.) (since 1983 only)

Book:

Foster, John W., (three chapters), Geothermal Phenomenon and Heat Flow, Production Water Wells, and The Shape of the Earth; Earth Science Series, Salem Press, Pasadena, CA, Dec. 1989. (refereed)

Journal Article:

Foster, John W., Natural Injection of Geopressured Fluid Possible (for enhanced oil recovery): Oil and Gas Journal, vol. 82, no. 39, Sept. 1984. (board refereed)

Patent:

Fryda, Lawrence and Foster, John W., U.S. Patent 4,807,201, Groundwater Pressure Measurement, United States Patent Office, Feb. 21, 1989 (Patent rights assigned to ISU). (refereed)

Papers Presented at Professional Meetings:

Foster, John W., The Nature and Signifance of Adsorption in Confined Groundwater Flow, Midwest Groundwater Conference, Little Rock, AK, Oct. 1986.

Foster, John W., The Nature of Groundwater's Unique Resistance to Clean-up Post Contamination, Scientific Symposium, The Ohio River Basin Consortium for Research and Education, Cincinnati, OH, Nov. 1986.

8. GRANT AWARDS (internal and external funding support)

Technology Commercialization Center, ISU, $37,000, Fryda and Foster for instrumentation, student assistance, downhole probe research, 1986, 1987. Grant led to U.S. Patent 4,807,201.

Technology Commercialization Center, ISU, $30,000, Fryda and Foster for instrumentation, student assistance, downhole probe research, 1987, 1988. Grant led to a second patent application.

9. PROFESSIONAL HONORS, AWARDS AND DISTINCTIONS:

Chosen by the U.S. Air Force Ballistic Missile Division and Bechtel Corporation, 1958, as a member of a four-man team to undertake site selection for hardened Atlas missile silos from New York to New Mexico. Assignment of 15 months with prime responsibilities around Strategic Air Command bases in Nebraska, Kansas and New Mexico.

Invited in 1959 by Ralph M. Parsons Co., Los Angeles, as project manager for exploration and development of fresh groundwater in Kuwait, a water supply for the City of Kuwait. Team discovered, evaluated and developed the first fresh water ever known in that country. Foster was cited by the Kuwait government for exemplary service to the Kuwait nation.

Invited by the House Energy Committee, Washington, 1981, to provide testimony on the potential of the HDR-phase of geothermal energy in the United States.

10. PROFESSIONAL MEMBERSHIPS (indicate offices held or other significant participation):

American Association of Engineering Geologists
National Association of Groundwater Scientists and Engineers
National Water Well Association
National Association of Geology Teachers
Fellow, Royal Society of Arts (inactive)
Illinois Academy of Science

11. PROFESSIONAL ACTIVITIES OFF CAMPUS:

Community services to Town of Normal in respect to public water supply from its production wells.
Periodic paid services to citizens groups with environmental concerns.
Occasional consulting services to Thermal Power Co. of San Francisco and other corporate entities.

1. NAME: **James G. Kirchner**

2. INITIAL DATE OF EMPLOYMENT AT ISU: 1969

3. DEGREES/CERTIFICATES (including dates, degree granting institution and field of study): B.S. Wayne State University 1960
   M.S. Wayne State University 1962
   Ph.D. University of Iowa 1971
   Field: Geology

4. CURRENT AREA(S) OF SPECIALIZATION: Mineralogy, Igneous Petrology, General Petrography, Field Geology

5. TEACHING ASSIGNMENT, ISU: Introduction to Geology I, Mineralogy, Igneous and Metamorphic Petrology, Geology of Ore Deposits, Optical Mineralogy, Field Geology

6. MAJOR SERVICE ACTIVITIES AND ASSIGNMENTS, ISU:

   Department Committees: Research Committee, Budget Committee, Geology Curriculum Committee, fiscal agent and budget planner for Geology Field Camp account, fiscal agent for John Wesley Powell Fund, DFSC (1983-84), campus representative for the Geological Society of America, author of Geology Newsletter.

   College Service: Ad hoc committee on proposed science and technology building (1985).

   University Service: Academic Senate (1985-88), Adjunct Curator for Geology at the University Museum (1985-present), Honor's Program representative for geology, Search Committee for director of the University Museum (1989), Asbestos analyst for ISU.

7. PUBLICATIONS AND OTHER CREATIVE ACTIVITIES (indicate if refereed journal, juried exhibit, etc.)

   Books:

   Lisenbee, A. et al (1985). Geology of the Tertiary intrusion province of the northern Black Hills, South Dakota and Wyoming, Geology of the Black Hills, South Dakota, 2nd ed.; F. J. Rich, ed; American Geological Institute, p. 33-105. (refereed)

   Nelson, R. S., J. G. Kirchner and T. K. Searight, 1988. Guidebook for 52nd Annual Tri-State Geological Field Conference; Illinois State University, Normal, 49 p.

   Journal Articles:

   Kirchner, J. G. (1985). Detrital and authigenic pyrite in an Illinoian lacustrine silt, central Illinois; Journal of Sedimentary Petrology, v. 55, p. 869-873. (refereed)

   Kirchner, J. G. and T. K. Searight (1989). A road rally as a topographic map exercise; Journal of Geological Education, v. 37, p. 7-9. (refereed)

Kirchner, J. G. (1989). Origin of pyrite nodules in the St. Peter sandstone, Buffalo Rock State Park, Illinois; Transactions of the Illinois State Academy of Science, v. 82, no. 1-2, p. 47-55. (refereed)

Papers Presented at Professional Meetings:

Kirchner, J. G. (1984). Analysis for asbestos: Methods and Interpretations; Illinois Environmental Health Association, Normal. (by invitation)

_____ (1984). Interpretation of various pyrite types in an Illinoian silt; (abs.): Transactions of the Illinois State Academy of Science, supplement to v. 77, p. 16; DeKalb.

_____ (1986). Separation of iron oxides from total iron in some phonolites: a microcomputer solution; (abs.): Transactions of the Illinois State Academy of Science, supplement to v. 79, p. 40; Edwardsville.

_____ (1987). Amphibole-bearing phonolites in the Black Hills, S.D.; (abs.): Transactions of the Illinois State Academy of Science, supplement to v. 80, p. 43; Charleston.

_____ (1988). Nodular pyrite in the St. Peter sandstone, Buffalo Rock State Park, Illinois; Transactions of the Illinois State Academy of Science, supplement to v. 81, p. 41; Peoria.

_____ (1989). First reported occurrence of the mineral mordenite in the Black Hills, S.D.; (abs.): Transactions of the Illinois State Academy of Science, supplement to v. 82, p. 49; Chicago.

8. GRANT AWARDS (internal and external funding support)

Targeted Research Grant for $1000 from College of Arts and Sciences (1986). Project: Amphibole-bearing phonolites in the Black Hills.

Small Grant for $995 from the Office of Research and Sponsored Programs-ISU (1987). Project: Geology and petrology of the peralkaline intrusions of the Deer Mountain-Terry Peak area, Black Hills, S.D.

9. PROFESSIONAL HONORS, AWARDS AND DISTINCTIONS: none

10. PROFESSIONAL MEMBERSHIPS (indicate offices held or other significant participation):

Geological Society of America (Fellow) (campus representative)
Sigma Xi, National Scientific Research Society
National Association of Geology Teachers
Illinois State Academy of Science
Yellowstone-Bighorn Research Association

11. PROFESSIONAL ACTIVITIES OFF CAMPUS:

Asbestos-analyst consultant, BCA Laboratory, Bloomington, IL
Visiting Professor for geology field camp, The University of Iowa (1984)

12. OTHER RELEVANT ACTIVITIES:

Helped organize and lead the 52nd Annual Tri-State Geological Field Conference at La Salle, Illinois, (1989)

1. NAME: **Robert S. Nelson**

2. INITIAL DATE OF EMPLOYMENT AT ISU: September 1970

3. DEGREES/CERTIFICATES (including dates, degree-granting institution and field of study): B. A. Augustana College 1965
M. S. The University of Iowa 1968
Field: Geology

4. CURRENT AREA(S) OF SPECIALIZATION: Environmental Geology, Surficial Processes, Structural Geology

5. TEACHING ASSIGNMENT, ISU: Introductory Physical Geology, Earth Science, Physical Geography, Life of the Geologic Past, Environmental Geology, Structural Geology, Geomorphology, Glacial and Quaternary Geology, Field Geology

6. MAJOR SERVICE ACTIVITIES AND ASSIGNMENTS, ISU:

Value Added Task Force
United Way Department Coordinator
Developed contractual relation between the Illinois Environmental Protection Agency and Illinois State University for specialized courses for the agency through the College of Continuing Education
Geology of Waste Disposal Sites, Fall 1986
Glacial and Quaternary Geology, Fall 1987
Preliminary geologic assessment of ISU Arena site

7. PUBLICATIONS AND OTHER CREATIVE ACTIVITIES (indicate if referred journal, juried exhibit, etc.) (since 1983 only)

Books:

Nelson, R. R., Kirchner, J. G. and Searight, T. K., 1988. Guidebook 52nd Annual Tri-State Geological Field Conference, The LaSalle Anticline and its Influence on Pennsylvanian Sedimentation in the LaSalle-Peru Area; Illinois State University, Normal, Illinois, 49 pages.

Nelson, R. S. and Reinertsen, D. L., 1984. A Guide to the Geology of the Pontiac-Streator Area; Illinois State Geological Survey Guide Leaflet 1984-C, 25 pages.

Reinertsen, D. L. and Nelson, R. S., 1983. A Guide to the Geology of the Lewiston-Spoon River Area; Illinois State Geological Survey Guide Leaflet 1983-C, 48 pages.

Journal Articles:

Nelson, R. S., 1984. Groundwater: Central Illinois' Hidden Resource, Central Illinois Business Magazine, Summer 1984, p. 10-12.

Papers Presented at Professional Meetings:

Nelson, R. S., (1988). RCRA compliance at Walnutport, Pennsylvania, Seminar of the Illinois State Geological Survey, Champaign, Illinois.

Nelson, R. S. (1987). Ice Loading of Glacial Lake Illinois Sediments, Peru, Illinois, Illinois Academy of Science.

Nelson, R. S. (1986). Geomorphic Evolution of Glacial Lake Ancona, Illinois State Academy of Science.

Searight, T. K. and Nelson, R. S. (1986). Basement Controls of Pennsylvanian Sedimentation in Northwestern Missouri, Illinois State Academy of Science.

Nelson, R. S. (1985). Geomorphology and Geology of FAP 412 Corridor, Federal Highway Works Administration Region 5 Geotechnical Conference.

Nelson, R. S. (1985). Imbricate Internal Structure of the Tiskilwa Till near Bloomington, Illinois, Geological Society of America, North-Central Section.

Nelson, R. S., (1984). Sand Grain Dimensional Stability in Wastewater Treatment Sand Filters, Illinois State Academy of Science.

Nelson, R. S., (1983). Plate Tectonics - Unifying Theory of Earth Science, Illinois Science Teachers Association.

Nelson, R. S., (1983). Discrimination Between Ablation Till and Lodgement Till Based on Relative Consistency, Illinois State Academy of Science.

8. GRANT AWARDS (internal and external funding support)

Geomorphology of FAP 412 Highway Corridor, Illinois State Museum (1985).

Indirect Reuse of Municipal Wastewater for Potable Purposes, Department of Energy and Natural Resources, joint proposal with departments of Biological Sciences, Chemistry, Geography-Geology and Allied Health (1989).

9. PROFESSIONAL HONORS, AWARDS AND DISTINCTIONS: none

10. PROFESSIONAL MEMBERSHIPS (indicate offices held or other significant participation):

American Geophysical Union
American Quaternary Association
Geological Society of America - Session Moderator (1985)
Illinois Earth Science Teachers Association - Vice President (1988-89)
Illinois State Academy of Science - Geology Section Chairman (1981-83)
National Assoc. of Geology Teachers - Central Section President (1985)

11. PROFESSIONAL ACTIVITIES OFF CAMPUS:

Geological consultant on over 50 projects from North Carolina to Wyoming
Expert witness on environmental geology
Advisor, McLean County Solid Waste Disposal Committee

12. OTHER RELEVANT ACTIVITIES:

Chairman, 52nd Annual Tri-State Geological Field Conference, 1988
Lead instructor, Honor Science Teacher Project (1986, 1989), funded by National Science Foundation
Chairman and facilitator, rock and fossils competition for Illinois Science Olympiad (1987, 1988, 1989)
Geology merit badge concilor, W. D. Boyce Council, Boy Scouts of America

1. NAME: **Thomas K. Searight**

2. INITIAL DATE OF EMPLOYMENT AT ISU: September, 1959

3. DEGREES/CERTIFICATES (including dates, degree-granting institution and field of study): A.B University of Missouri 1951
M.A. University of Missouri 1952
Ph.D. University of Illinois 1959
Field: Geology

4. CURRENT AREA(S) OF SPECIALIZATION:

Sedimentology and Stratigraphy of Pennsylvanian rocks in the Midcontinent, United States
Photogeology
Field Geology

5. TEACHING ASSIGNMENTS, ISU: Introductory Geology I (Physical Geology)
Introductory Geology II (Historical Geology)
Introductory Geology Laboratory
Geologic Techniques
Sedimentology
Stratigraphy
Regional Geology of the United States
Economic Geology of Fossil Fuels
Field Geology

6. MAJOR SERVICE ACTIVITIES AND ASSIGNMENTS, ISU:

Academic Advisement, undergraduate Geology Majors and Minors
DFSC - Department of Geography-Geology
Chairer Search Committee, 1988-89
Search Committee, Tenure Track Position, Paleontology, 1988-89
Geology Curriculum Committee
Curriculum Committee, Department of Geography-Geology

7. PUBLICATIONS AND OTHER CREATIVE ACTIVITIES (indicate if refereed journal, juried exhibit, etc.)

Journal Articles:

Searight, Thomas K., and Kirchner, James G., 1988. A Road Ralley as a Topographic Map Exercise: Journal of Geological Education, v. 37, no. 1, p. 7-9.

Searight, Thomas K., Nelson, Robert S., and Kirchner, James G., 1988. Pennsylvanian System including stops 1, 2, and 4: Guidebook for 52nd Annual Tri-State Field Conference: Illinois State University, pp. 8-15, 19-26, and 31-32.

Searight, Thomas K., 1985. A Simulated Computer-Assisted Petroleum Exploration and Development Exercise for Undergraduate Geology Students: Journal of Geological Education, v. 33, no. 1, p. 45-52.

Searight, Thomas K., 1983. Geological History of the Mackinaw Member of the Henry Formation in the Illinois River Valley in Tazewell County, Illinois: Transactions of the Illinois Academy of Science, v. 76, no. 3 and 4, p. 311-320.

8. GRANT AWARDS (internal and external funding support): none

9. PROFESSIONAL HONORS, AWARDS AND DISTINCTIONS: none

10. PROFESSIONAL MEMBERSHIPS (indicate offices held or other significant participation):

Geological Society of America
American Association of Petroleum Geologists
Society of Economic Paleontologists and Mineralogists
National Association of Geology Teachers
Illinois Academy of Science

11. PROFESSIONAL ACTIVITIES OFF CAMPUS:

Co-leader 52nd Annual Tri-State Geological Field Conference. 1988

12. OTHER RELEVANT ACTIVITIES:

Faculty member at NIU-ISU Summer Field Camp - 1983-89.

Short Course on the Geology and Ecology of the Southern Front Range, Colorado, taught with Dr. Charles Thompson, Department of Biological Sciences, ISU.

NEW ACADEMIC PROGRAM REQUEST

1. Name of Institution: ILLINOIS STATE UNIVERSITY

2. (a) Title of Proposed Program: **M.S. in GEOHYDROLOGY**

   (b) Total New State Resources Requested: $242,560

3. 6-Digit CIPS Code: 40.0699

4. Proposed date for initiation of program: FALL TERM 1989

5. Date of submission: October 28, 1987

6. Site: on-campus

6a. Abstract

Geohydrology is a field of science which embraces society's concern for Earth's most precious geologic resource, water in the subsurface, and for environmental protection of the water supply. The proposed master's degree will prepare students who are knowledgeable and proficient in the theory and significance of hydrodynamics; who can design, implement, and evaluate a groundwater exploration program and a monitor-well field for the purpose of determining the nature and extent of groundwater contamination; who can investigate and evaluate geologic and hydrologic hazards; who can plan and implement dewatering operations; and who can visualize the critical, geological third dimension - the subsurface. Geological science has long been unreasonably focused on the petroleum industry and illogically inattentive to geohydrology. The faculty at I.S.U. have unique professional qualifications and extensive experience in groundwater and environmental geology at state, national, and international levels.

MISSION

7. **Rationale:**

The science of geology encompasses a broad spectrum of subdisciplines each of which may lead a geologist to employment in one of a variety of scientific pursuits. Such directions include employment in the exploration for and the exploitation of metallic ore deposits, fossil fuels, radioactive minerals or groundwater. Geologists also work in the environmental field or for government geological surveys, highway departments, engineering firms and companies which supply construction resources, such as limestone and gravel. Still others combine geology with parallel fields to work in geo-technologies, geological engineering, geophysics, geochemistry and oceanography.

Each of the many subdisciplines in geology provides ample opportunities for scholarly research, not by any means limited to those specialists who elect academia for careers. Many of the most notable scientific achievements in geology have resulted from the work of talented professionals employed in industry, especially in the subdisciplines which yield direct benefits to society. In

geohydrology, there is a serious shortage of specialists prepared to contribute to research in both theory and applications.

Among the geological fields of endeavor which are ripe for improved, innovative academic preparation is subsurface water and its infinite complexities. Graduates will have the professional preparation to make lasting research contributions to the science and to be qualified for positions in the public and private sectors.

The civil engineering profession, virtually by default, long-ago assumed scientific responsibilities in both subsurface hydrology and environmental geology. This situation has resulted from the failure of higher education to design programs aimed specifically at the development of geologists in these areas of concern.

Faculty geologists at universities have certain conventional signatures. All have academic credentials which include broad scholarly exposure to geological science and a specific interest in a sub-discipline. Other than those in petroleum geology, few of the traditional professors have ever served the private sector on a full-time basis nor have they been decision-making administrators of public agencies. Only a small fraction of geology teachers have a comprehension of the new sub-discipline of geohydrology.

New university programs are usually initiated by the chairs and faculty of departments. Rarely would a new program be injected from the outside, from industry or from state government initiative. It is understandable that the academic world, generally speaking, could be blind to important new scientific sub-disciplines, thereby failing to see the challenge. The principal author of this program request, having been privileged to be a faculty member with a non-traditional background, would wish to see I.S.U. become a national leader in scholarship and achievement in geohydrology.

It is finally being realized that civil engineers are not qualified to evaluate the geological aspects of water and of environmental problems. In fact, the Federal Resource, Conservation and Recovery Act of 1980, as amended in 1985, specifically requires qualified geologists to evaluate and certify the plans for well fields designed to monitor groundwater contamination. This job previously was performed by engineers. As EPA-mandated monitoring increases, and as the need for groundwater resources increases so shall the demand for geologists qualified in these areas.

Most geologists, whatever their specialization, work with geologists from other subdisciplines. Therefore, the traditional undergraduate education in geology provides broad coverage of the science. Specialization must be reserved for graduate school. Consequently, the most appropriate degree for geology graduates is a master's degree in a specific subdiscipline.

Illinois State University is in a unique position to react to the evolving picture in geology, which shows a serious loss of activity in the field of petroleum. Most other state universities with large geology faculties are unable to adapt quickly to new directions because of the entrenchment of faculty specializations geared toward the petroleum industry and other traditional areas.

Consequently, they tend to offer advanced degrees with emphases across the spectrum of the geological sciences. Some offer emphases in groundwater and environmental geology as part of their broader offerings, but few have a designated focus in that direction. Two of the faculty of geology at ISU have professional qualifications and extensive practical experience in groundwater and environmental geology on a state, national and international level. Several 300-level courses which are relevant to groundwater and environmental studies are currently offered. The excellence of the well-rounded undergraduate curriculum will be maintained in parallel with the graduate program which is to be served by the specifically designed core of 400-level courses.

Concerning the degree title:

Geohydrology is proposed as a carefully chosen title. The title addresses a long-standing weakness in the discipline of groundwater science. Progressive development in geohydrology has been impaired over the past five decades by the emergence of an artificial professional barrier. On the one side of that imaginary line are the groundwater geologists who focus on the physical parameters of aquifers and their subsurface environments. On the other side are the analytical hydrologists, specialists drawn largely from the ranks of non-geologists who focus on the behavior of subsurface waters and the analytical aspects of hydrodynamics. This professional distinction has proven to be an ill-conceived tradition and one which needs to be avoided in the structure of graduate-level academic programs.

Note, for example, that in research on the groundwater resources of Illinois, the State Geological Survey is primarily responsible for the physical occurrence, size, shape, composition and geologic setting of aquifers. The State Water Survey focuses on the hydrologic aspects and the chemical quality of subsurface waters. This separation of responsibility derived originally from the tradition described above. While administratively convenient, the system has always conferred an inherent weakness in professional performance.

When groundwater science was in embryo in the early '30s, most geologists were not inclined toward nor well-trained in analytical mathematics. Analytical mathematics is required for research and performance in hydrodynamics. Therefore, groundwater hydrology in the early 30's drew upon the services of mathemeticians and engineers, not by logical assignment, but by default from geologists. Today, however, majors in outstanding geology programs (such as I.S.U.) are fully prepared to study the complexities of groundwater dynamics at the graduate level.

The traditional professional barrier between geology and subsurface hydrology is intolerable for the well-rounded groundwater scientist. Excellence in performance in this field is unattainable without dismantling the unfortunate man-made barrier. To illustrate the point, the following scientific principles are cited:

> Groundwater has motion as a result of hydraulic gradient within a specific aquifer. A piezometric map shows contours which illustrate the hydraulic gradient. If the gradient appears as an uninterrupted slope, the physical aquifer very likely has consistent thickness and homogeneity. But if the gradient shows inconsistency, for example, a belt where the gradient is locally steep, the aquifer either suffers from thinning in that belt or suf-

fers lower hydraulic conductivity, or a combination of the two.

Hydraulic gradients have three dimensions, and a vertical or oblique gradient is not uncommon. The nature of such complexities of gradient is revealing of geological detail which may be efficiently studied only through the hydrodynamic behavior.

Calculations on the velocity of groundwater flow are critical in environmental affairs, especially where an aquifer may have suffered contamination. How soon will contaminated water reach a city's well field? Analyses of velocity require hydrologic and geologic details which are blended into equations.

The title, "Geohydrology," connotes precisely the logical integration which is demanded by the complex challenges in this discipline. The natural interrelationship between environmental and resource geohydrology is the basis on which the program was developed. The following points are significant:

1. The title "Geohydrology" (rather than "Hydrogeology") was selected to indicate the broader objective of treating resources and environmental concerns as a unit. The term hydrogeology implies "the geology of water", not indicative of hydro-dynamics which is part and parcel of the program.

2. Nearly all consulting firms which specialize in groundwater undertake investigations in groundwater contamination problems, although their primary work may lie in resource development and aquifer hydrology. Therefore, graduates of the proposed M.S. degree will find their employability enhanced by the combined focus.

3. Finally, M.S. degrees in groundwater geology are offered at several universities; graduate degrees in environmental fields are not rare. Part of the uniqueness of ISU's geohydrology program lies in the logic of combining these intertwined disciplines.

Appendix A contains a position announcement received from the University of California at Davis, dated September 10, 1987. The announcement is a demonstration that "Geohydrology" is becoming recognized, albeit slowly, in academic institutions of high quality.

Objectives:

The goal of the Geohydrology program is to deliver a balanced set of core courses which, when combined with other required and elective courses, will enable graduate students to become knowledgeable in applied environmental and resource geohydrology. Graduates will enter the job market capable and ready to perform professional responsibilities from a solid academic base needed for career growth. The M.S. in Geohydrology will prepare students to:

A. become knowledgeable and proficient in the theory and significance of hydrodynamics;
B. design, implement and evaluate a groundwater exploration program;

C. design and supervise the installation of a monitor-well field and evaluate its results for the purpose of determining the nature and extent of groundwater contamination, in accordance with government regulations;
D. develop skills in the scientific management of water resource areas;
E. gather and evaluate geologic data necessary to prepare environmental impact analysis reports;
F. identify and evaluate potential geologic and hydrologic hazards, such as those associated with seismic activity, volcanism, flooding, subsidence and slope instability; students will be competent to evaluate erosional and sediment depositional problems and will be able to recommend corrective or precautionary procedures to mitigate such hazards and problems;
G. plan and implement dewatering operations for underground construction, storm drainage alignments, foundation stability and pipeline laying;
H. evaluate the subsurface conditions which bear upon shallow burial and deep-well waste disposal;
I. critique the geologic aspects of engineering designs and proposals;
J. appreciate the social, ethical and legal implications of environmental issues faced by modern society.

Relation to University Plan and Mission:

The initiation of a Master's Degree in Geohydrology will contribute to the University's mission "to provide master's degree programs which are among the best of the public institutions in Illinois . . ." The proposed program is not only planned to be one of excellence, but also one which is unique within the state. No other university in the state and only one in the surrounding mid-continent states offers a program with such a combined focus at this level (see section #20).

The emerging definition and scope of environmental and groundwater supply problems are opening new avenues for theoretical and applied research in the geological sciences. Research in these areas is in its infancy and will expand rapidly in the ensuing years as new problems and techniques appear. Thus, the proposed program will fulfill the University's mission, "to produce nationally recognized research in selected areas with an emphasis on the application of theory to new settings and problems."

The University also encourages public service which extends and augments the University's teaching and research missions. The two existing faculty members qualified to practice in geohydrology and environmental geology are involved in consulting projects in these fields within of the State of Illinois, in other states and abroad. Each of these faculty members has recently taught graduate-level courses at the Illinois Environmental Protection Agency in Springfield. Problems such as environmental effects of highway U.S. 51, groundwater contamination at waste disposal and industrial sites, slope stability and extent of groundwater resources have been investigated. Projects of this nature can be expected to increase when the new program is initiated. As a part of its service function, the University is a member of the Ohio River Basin Consortium for Research and Education and one of the faculty members is an appointed trustee of the organization. There would be mutual benefits for the Consortium and for ISU which would result with the establishment of the proposed program.

Relation to College Plan and Mission:

The mission of the College of Arts and Sciences is to "provide a liberal education of high quality and professional training in specific areas." One of the objectives states the College should, "propose new programs based on need and strength of existing programs." The undergraduate program in geology has been recognized for its quality by members of other institutions within and outside of Illinois (see documentation in Appendix B). It is on this foundation and the expertise of the faculty that the new program request is based.

The Geology faculty at I.S.U. hold the philosophy that scholarly endeavors in the sciences are served best by those with liberal arts backgrounds on a level of importance which matches endeavors in the humanities. Liberal education is a component and a fundamental base for all programs in the College of Arts and Sciences. The professional curriculum proposed in this document is based on such foundations. As in most foundations, backgrounds in liberal arts may be largely unseen from the exterior but are a critical component in career performance of the graduates. If scientists serve mankind, they should understand mankind's societies and mankind itself.

8. Effects of the proposed program on other programs:

The proposed graduate program will have no negative effect on other programs at Illinois State University. The Department currently has no graduate degree offering. Many geology graduates attend other universities to obtain graduate degrees in a variety of geological disciplines. The proposed program will replace no existing University programs, nor will student enrollment in the program detrimentally affect enrollments in other University academic areas. On the contrary, the curricular options described in Section 9 are certain to add enrollments in 300 and 400-level courses in several other departments, including mathematics, biology, English, economics, and chemistry. A number of students, ISU graduates in particular, will have had the required courses in groundwater geology and/or engineering geology and, therefore, will have more hours available for electives in the graduate program. These students will be encouraged to take courses in other departments. The existing B.S. degree in Geology is supported in the other sciences by the Departments of Chemistry, Physics and Mathematics, from which courses are required for all geology majors. Students enrolled in the proposed Master's program who were not graduates from the I.S.U. undergraduate geology program will be required to correct deficiencies, if any, by enrollment in undergraduate courses from these departments.

CURRICULUM
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The M.S. in Geohydrology is a program focusing specifically on groundwater as a dynamic resource and as a component of environmental science. The program is directed toward preparing graduates for careers in the areas of groundwater resources and environmental problems of a geohydrologic nature.

Admission to the program will require students to have completed a baccalaureate degree in geology or earth science. Students with degrees from

other natural sciences and engineering may apply to the program and course deficiencies will be determined by transcript evaluation. A plan of study will be developed to allow students to overcome deficiencies. A minimum of two semesters each of chemistry, physics and calculus are required. Conditional admission is allowed until deficiencies in supporting areas are overcome. A minimum "B" average in prior geology coursework is also required. Scores for the general aptitude and advanced-geology Graduate Record Exam and three letters of recommendation must be submitted.

Degree Requirements:

Thirty-two semester hours of coursework are required, including completion of a written thesis. The 32 hours includes a required group of core-courses (23 semester hours) including GEL 360, 362, 435, 439, 444, 452, 456 and 488, and 4-6 semester hours of thesis research. Up to six semester hours credit may be obtained for approved Professional Practice (co-op and internship) programs. A minimum of a 3.0 "B" average must be maintained in all graduate coursework.

9. The proposed program would have a core requirement of 23 semester hours comprised of the following courses:

Groundwater Geology-360	3 hours
Engineering Geology-362	3 hours
*Fluid Flow in Earth Materials-435	3 hours
*Geochemistry of Meteoric Waters-439	3 hours
*Groundwater Development and Resource Management-444	3 hours
*Geology of Waste Disposal-452	3 hours
*Problems in Environmental Geology-456	3 hours
*Seminar-488 (may be repeated for a different topic)	2 hours

Those courses with an asterisk are new courses that will be introduced at the 400-level.

The core requirements are considered essential to prepare students to be competent professional geologists in the fields of groundwater resources and environmental geohydrology. In addition, students will be required to take 4-6 semester hours of thesis research. Theses directed toward applied research will be encouraged. Students will receive credit for thesis, Professional Practice and research under course numbers established University-wide.

The core courses and the thesis requirement will amount to 27-29 hours of the required 32 hours. Students who have had Groundwater Geology and/or Engineering Geology as undergraduates will have to take three or more semester hours of elective courses. Appropriate courses at the 300-level are already available within the Department including Computer Cartography (302), Remote Sensing I (305), Geomorphology (380), Regional Geology of the United States (384), Optical Mineralogy (390), Remote Sensing II (355), Geophysics (364), Glacial and Quaternary Geology (382) and Cartographic Processes (351). Additional hours in seminar at the 400-level could also be taken, provided the seminar topics were not the same as those previously taken. Appropriate courses in other departments include Applied Computer Modeling (ACS 345),

Analytical Chemistry (CHE 315), Qualitative Organic Analysis (CHE 323), Environmental Economics (ECO 355), Technical Writing II (ENG 349), Mathematical Statistics I, II (MAT 350, 351), Statistical Computing (MAT 356) and Electronics for Scientists (PHY 375).

10. Achievement of Objectives:

The geology courses applicable to the proposed program are described in section 14. The content of these courses is designed to prepare students in the expertise needed to meet the stated objectives. This program is not designed to allow a student to take a few courses relating to groundwater or environmental hydrogeology from a wide field of coursework and claim some expertise, as might be done at other universities which have graduate programs with a broader focus. Indeed, most graduate institutions do not offer more than one course each in groundwater and environmental geology. Instead, the entire proposed curriculum is designed around the objectives for this clearly defined, critical area of geology.

Within each course of the proposed curriculum, a balance between theoretical and applied aspects is planned. Case studies and practical problems will be used throughout the program. Several courses will involve field practice and study. Report writing involving data gathering, project planning and evaluation will be used as part of the teaching methodology. Upon completion of the program, it is anticipated the graduates will have not only a knowledge of the fundamental concepts underlying and influencing groundwater and environmental hydrogeological conditions, but will also possess practical experience in dealing with the problems to be encountered. Applied aspects which are ordinarily learned in the field, and not in most classrooms, will be emphasized and will make the program unique.

11. Admission and prerequisite requirements:

Applicants for admission must have a baccalaureate degree in geology or earth science and a minimum of one academic year each of calculus, general chemistry and general physics. Those applicants with deficiencies may be admitted conditionally until the deficiencies are overcome. Applicants with degrees from other science areas and from engineering may be admitted conditionally provided a plan of study is arranged to cover essential courses in geology and supporting areas. In addition, all applicants must meet the grade point requirements of the Graduate School, submit scores for the general aptitude and advanced-geology Graduate Record Exam. The G.R.E. scores will be used primarily for the detection of areas in the student's undergraduate geological education which may appear weak, possibly requiring correction prior to the gaining of unconditional admission to the ISU program. Three letters of recommendation from academic and/or professional sources are required.

12. Acceptance of proficiency examination, transfer credit and prior experience.

University policy will be followed concerning transfer credit. This policy allows a maximum of nine semester hours for ISU graduates and for

graduates from other institutions. Graduate School approval is required. Proficiency exams will not be provided at the graduate level, and job experience will not be accepted for credit in lieu of course work.

13. **Other degree completion requirements:**

In order to fulfill degree requirements, students must complete a written thesis acceptable to the faculty and the Graduate School and must successfully complete an oral examination in geohydrologic science and defense of the thesis. A grade-point average of 3.0 (on a 4.0 scale) must be maintained to remain in good academic standing. All requirements must be completed within six years of admission to the program.

Most geohydrologic problems involve determining the physical parameters of materials and characterizing the movement of fluids and/or contaminants through these materials under various conditions. Thus, students in this program are expected to be competent in the descriptive aspects of geology as is embodied in a typical undergraduate curriculum such as those certified by the American Institute of Professional Geologists (the undergraduate geology program at ISU is certified by the institute) and are also expected to become competent in statistical and computational skills as well as learn to use existing computer software for modeling. Hands-on experience is vital to development of these skills. Thus, computer modeling will be part of each of the 400 level courses proposed for this program.

14. **EXPANDED COURSE DESCRIPTIONS**

New core courses, as proposed:

GEL 435--Fluid Flow in Earth Materials 3 Sem. Hrs.

This course will focus on subsurface fluid dynamics in three dimensions and under the infinite varieties of geologic environments. Given the significance of fluid behavior in today's environmental concerns, fluid flow through materials of very low hydraulic conductivity (i.e., 1×10^{-8} cm/sec.), will be studied as well as fluid flow through materials of aquifer conductivities. Studies will include the phenomenon of adsorption, which makes geologic material extremely difficult to sanitize once contaminated, especially fine-grained clastic sediments.

The relationship between natural hydraulic gradients and man-induced gradients, resulting from pumping, will be examined in respect to both groundwater resources and environmental hydrodynamics. This and other complex problems will be addressed in part by computer modeling.

Students will gain experience in field-data collection, using advanced instruments (some of which are under research and development and patent processing by Geology faculty, funded by external contracts, in collaboration with electronics faculty of I.S.U's Department of Industrial Technology).

This course is designed as part of the early core sequence and will provide students with advanced fundamentals and the mathematical procedures

required in geohydrology.

GEL 439--Geochemistry of Meteoric Waters 3 Sem. Hrs.

This course will address the physical characteristics of water (color, odor, temperature, taste and suspended solids) and chemical and biological impurities. Advanced studies will focus on the nature of water as a chemical fluid and the unique acidity of meteoric water from atmospheric carbon dioxide.

Water will be studied as a solvent of minerals and man-induced contaminant sources including cation exchange between solute and natural mineral constituents of soils and subsurface materials. Adsorption by minerals, natural processes of solution and deposition, hydrolysis, hydration, photochemical reactions, oxidation, reduction, filtration and volatilization in surface and subsurface water systems are all essential components of the course.

The course will include the study of water quality standards and tolerances, contamination, characteristics of natural materials bearing on contaminant dispersion, modeling of dispersion, and considerations of possible geologic or geochemical remedies for water quality problems.

GEL 444--Groundwater Development and Resource Management 3 Sem. Hrs.

Students will examine the scientific approach to the development and expansion of public and industrial groundwater supplies, such as long range planning and strategies to meet peak-demand, short-term system loads. Existing and probable future practices in water resource allocation and concepts of beneficial use will be studied, along with principles of multiple use, and inhibitions to multiple use strategies.

The course will include the study of artificial recharge systems, (the enhancement of natural groundwater renewability), advanced concepts for the maintenance of subsurface fluid pressures, the protection of groundwater quality, and interrelationships between surface and subsurface water. The course will also address the economics of water as a commodity and the concept of enforcing conservation by a price structure. Case histories will be emphasized.

Students will study materials selection, design and installation of water supply facilities for community and industrial service, the design of production water wells, construction technology and pumping facilities, water storage units/standpipes, and line pressure stabilization methods.

GEL 452--Geology of Waste Disposal 3 Sem. Hrs.

This course will focus on the relationship between varieties of subsurface environments and the varieties of waste materials and chemicals. Waste types include sewerage, toxic chemicals, biochemical pollutants, and radioactive contaminants.

Systems of disposal by shallow burial will be studied, as well as the ponding of contaminated fluids, methods of investigation of pertinent geologic conditions in respect to the permissibility or impermissibility of disposal system designs, monitoring systems, effective designs and regulations thereof, and protection of water supply sources, surface and groundwater.

Soil column analysis will be used to demonstrate the ability of soils and liners to retain contaminants. Data obtained from soil column analysis will be used to calculate breakthrough curves for each contaminant for a given soil and liner configuration.

Attention will be given to the special problems of radioactive waste, sources of such waste and the varieties of levels, types of radiation, deep burial concepts and of deep-well disposal opportunities and risks.

GEL 456--Problems in Environmental Geology 3 Sem. Hrs.

Specific examinations will be made of the geological-environmental effects of natural and man-induced hazards: earthquakes, volcanism, shoreline and stream dynamics, slope failure and subsidence. Case studies will be emphasized throughout. Preparation of environmental impact reports will be practiced.

Special emphasis will be given to those hazards which pose threats to environmental safety, human and ecology. Studies will be made on the available geologic techniques for avoidance of risk situations by forethought.

Slope stability problems will be emphasized for quantitative analysis because of the interplay of the nature of materials, geologic history and geohydrology. Software programs will be used to produce convergent curves to enable prediction of slope instability.

The relationship between geology and the effects of acid rain/fog and the ameliorating influence of certain surficial geologic conditions will be addressed. Course includes examination of the geologic origins of radioactive radon gas, daughter products, and case studies of locales of known radon concentrations.

GEL 488--Graduate Seminar 2 Sem. Hrs.

Suggested Topics:

Water Resources and Environmental Law

Seminar will include examination of Federal and State environmental laws and regulations, (especially pertaining to the meeting of geologic standards), history of water law, from riparian to prior appropriation, English rule to American rule, the doctrine of mutual prescription, landmark disputes and court decisions and the legal significance of precedent.

Problems in Groundwater Protection

Seminar will include in-depth studies of real-life contamination problems, attempts at aquifer rehabilitation, and of conditions which create high-risk susceptibility.

Advanced Sedimentology and Sedimentary Petrology

Seminar will include concentrated studies in the nature of sedimentary deposition (especially those sediments which bear upon environmental geology), detailed examination of the processes of diagenesis and the resultant lithification of sediments, physical-chemical changes stemming from diagenesis and climatic influence on the processes.

GEL 490 Research in Environmental and Resource Geohydrology 1-6 Sem. Hrs.

Individual research on specific, appropriate topics.

GEL 498 Professional Practice 1-6 Sem. Hrs.

Internships and co-operative experiences on a professional level with a private or public organization.

GEL 499 Master's Thesis 1-6 Sem. Hrs.

EXISTING COURSES ESSENTIAL TO THE PROPOSED PROGRAM:

GEL 360 Groundwater Geology 3 Sem. Hrs.

This course is a comprehensive study of the nature of groundwater as a dynamic geologic resource. GEL 360 includes study of the relationship between surface and subsurface water and meteoric origins, examination of porosity in the varieties of soils and rocks capable of storing groundwater; the critical relationship between porosity and hydraulic conductivity; the discoveries by Henry Darcy and the evolution of equations enabling quantitative applications of the Darcy law; the nature and origins of hydrostatic pressure, pressure gradients and the dynamics of groundwater therefrom; studies in techniques by which aquifers are evaluated in respect to dynamic performance; the technology of well construction, well designs and materials; pumping-test procedures; confined, semi-confined and free-water aquifers; the application of equations pertinent to quantitative analyses of each aquifer type; region-by-region study of North American aquifers of note; freshwater saltwater interfaces and man-induced changes of interface configurations in three dimensions; introduction to water quality and the tolerance limits for plants and animals.

GEL 362 Engineering Geology 3 Sem. Hrs.

This course introduces the intimacy of geology and all engineering operations which make use of geologic materials or which depend upon the subsurface. Course includes study in the following areas: geostatic/hydrostatic pressures and the significance of their relationship; deformation of soils and

rocks - elastic and ductile strain in response to stress; rock strengths and the nature of rock failure; man-induced fracturing of rock by hydraulic pressure and calculations on pressures required to fracture rock at various depths; studies in dams, site selection for various types of dams, along with analyses of reservoir geology; equation for calculating projected loss of reservoir water from seepage through earth-fill dams and selection of materials for the cores of earthen dams; geology of foundations for large structures and foundation designs; varieties of Portland cement, components of cement mixes and concrete strengths ultimately achieved; geology of highway design, route alignments, cut and fill specifications; drilling technology and drilling muds; core recovery methods; geologic aspects of petroleum engineering; enhanced oil-well recovery technologies and oil-field recovery enhancement systems; wireline services and techniquesl calculations on horsepower requirements for well pumps and the economics of various energy sources for prime movers.

NOTE: Both GEL 360 and GEL 362 require that students learn and/or demonstrate skills in mathematical computations, where answers do not derive from the application of equations per se. (Example: Calculate the hydraulic pressure which must be developed by ground surface pumping facilities in order to initiate the fracture of massive rock at 19,900 ft., where the mud density = 1.5, the tensile strength of the rock = 860 psi and the average rock density = 2.85.) Such skills are indispensable in the practice of geology involving subsurface fluids.

15. Program for part-time clientele:

Although some students are expected to enroll in the program on a part-time basis, most students will participate full-time. In the initial stages, courses will be offered in sequence to obtain maximum cost-effectiveness. After enrollment has increased, courses will be offered at least annually.

16. Unit exercising academic responsibility:

A Director of Graduate Studies within the Department of Geography-Geology and the Geology faculty will be responsible for the graduate program. Traditionally, the Geology faculty have acted semi-autonomously as a committee-of-the-whole in regard to many of the functions of operating the Geology program. Such functions have included faculty assignments, curriculum design, planning, equipment and facilities requests and internal program evaluation. There are no plans to request exceptions to College or University academic policies.

STUDENT INFORMATION

17. Table IV-3 provides projections for student enrollment and credit hours generated for the proposed program.

Table IV-3

ENROLLMENT AND CREDIT HOUR PROJECTIONS
FOR THE NEW PROGRAM

Line Code	('85) Past Year	('86) Current Year	Budget Year	2nd Year	3rd Year	4th Year	5th Year
01 Number of Program Majors (Fall Headcount)	NA	NA	7	15	19	23	25
Annual full-time equivalent (FTE) Majors	NA	NA	6	13	17	22	24
Annual number of credit hours generated by Majors and non-Majors in existing courses that are needed to support the proposed curriculum							
Curriculum:							
Majors	NA	NA	30	60	96	132	144
non-Majors	1394	1505	1518	1536	1548	1548	1548
Annual number of credit hours generated by Majors and non-Majors in new courses that are needed to support the proposed curriculum							
Curriculum:							
Majors	NA	NA	90	185	241	310	336
non-Majors	NA	NA	24	30	30	30	30
Annual number of degrees awarded	0	0	0	6	8	11	12
Total number of students (Majors and non-Majors) served through course offerings of the Program	NA	NA	34	61	68	72	74

TABLE IV-3 EXPLANATION OF NUMBERS

Notes:

Through year five, at least, 12 concurrent theses will be the maximum number which can be supervised by the geology faculty. Therefore, FTE enrollment is expected to be held at the level where not more than 12 candidates shall undertake thesis research in any semester.

Table numbers are based on the assumption that, on average by FTE candidates, each student will generate the following credit hours of 400-level core courses by semesters: 1st semester = 6; 2nd semester = 9; 3rd semester = 7; 4th semester = 6 (by thesis).

It is assumed that unknown numbers of newly enrolled students will be required to complete deficiencies, for example, in the required existing 300-level core courses in calculus (MAT) or in chemistry. This indicates that six hours may be a reasonable estimate, on average, for enrollment by first semester students in the 400-level core courses.

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01 Ratio of full-time students to half-time students does not yield to accurate estimates, so fall term headcount of program majors is an educated guess.

02 Numbers of FTE majors is prognosticated on the basis of a modest start-up followed by growth to the maximum of about 12 new candidates at year 4.

03 For majors we assume that the average FTE will take 4 existing 300-level courses, in the Department or in other departments.

For non-majors the figures are based upon enrollments in existing courses which are required for the Baccalaureate degree in Geology--plus graduates-at-large.

04 See notes above. For non-majors the figures are based upon projected enrollments by graduates-at-large, e.g., students from other graduate programs who would enroll for credit in specific new courses, transferring the credit to their principal institution.

05 Figures do not reflect drop-outs (-) nor degree awards earned in less than 4 semester (+). The one is assumed to balance the other.

06 Figures are the sum of (a) undergraduates enrolled in existing 300-level program core courses; (b) graduates-at-large; and (c) majors.

18. The proposed program is not expected to serve other programs, because the content of most courses presumes considerable prior coursework in geology. Other graduate programs at ISU have little overlapping interest with geology. However, a few graduate students in chemistry who are particularly interested in environmental chemistry may enroll in some courses, such as Geochemistry of Meteoric Waters. These students are not included in the calculations on lines 03 and 04 of Table IV-3.

19. The program is expected to attract students from two experience/academic backgrounds. First, the program will attract students who have just received their Baccalaureate degree who wish to obtain a Masters degree to develop a career in the water-resources or environmental fields. These would mostly be full-time students in residence. The second group expected to be attracted to the program would be practicing geologists or environmental scientists working for engineering firms and government agencies, such as the Environmental Protection Agency. These students would be seeking advanced study for professional development and/or to upgrade their knowledge for career advancement. Most of these students would be part-time, commuting students over 25 years of age. It is estimated this second group would comprise about one quarter of the total clientele, while full-time resident students would comprise three-quarters.

On a nationwide basis, women comprise 10-15% of the undergraduate students in geology. Enrollment of women in the undergraduate program typically ranges between 10% to 20%. Minority interest in the geological sciences tends to be very low on both a statewide and national scale. Minority enrollment in baccalaureate programs is less than two percent nationally.

20. Other Programs

The graduate catalogues of sixty-nine major state universities and colleges in the central region of the United States were selected and surveyed. The criterion for selection was that the institutions were located within Illinois or were in states contiguous to or near Illinois.

One purpose of the search was to determine if any of the surveyed institutions offered programs similar to the designated masters as outlined in the present proposal. A second purpose was to ascertain whether the proposed program duplicated programs offered by any other Illinois university or college. A third purpose was to identify differences between the proposed program and those offered elsewhere.

Four graduate programs are offered with a focus on groundwater or hydrology or environmental geology or environmental engineering, categorized as follows:

Engineering orientation - Purdue University
M.S. Hydrology

Environmental orientation - University of Akron
M.S. Environmental Geology

Case Western Reserve
M.S. Environmental and Urban Geology

Groundwater orientation - Ohio University (Athens)
M.S. Hydrogeology

The program most comparable to that which is proposed for ISU is the offering at Ohio University, which has gained a considerable reputation in applied, practical hydrogeology. The Ohio University program does not include a core curriculum similar to that described in this proposal in respect to geochemistry, waste disposal and the geohydrologic aspects of environmental concerns.

Northern Illinois University offers a Ph.D. degree with a track in hydrogeology. The graduate program at NIU, however, is not oriented toward applied research and problem solving. It has an orientation toward theoretical science for students who intend to qualify for faculty positions or for the more esoteric research opportunities. ISU and NIU have a close working relationship in geology, as illustrated by the joint summer field camp in the Black Hills, South Dakota. Some graduates of ISU's proposed M.S. program may opt to pursue the doctorate degree at NIU or elsewhere, should they wish to direct their careers toward academia.

No programs were found in the United States which match the specific core proposed at I.S.U. The core curriculum proposed at ISU has been carefully designed to provide students with precisely the exposure and specific academic experience they require as operating professionals in the geohydrology.

A number of schools offer a curriculum entitled Environmental Engineering. These programs are typically offered within the Engineering College and emphasize an engineering approach. However, it is uncommon for engineers to have sufficient knowledge of geology to deal adequately with the scientific aspects of problems encountered in these areas. Examples of institutions offering this type of program include: University of Illinois, University of Louisville, University of Missouri/Rolla, University of Iowa and Michigan Tech.

There are also a number of universities offering programs entitled Environmental Science or Environmental Studies. Such programs tend to be broad-based; that is, they are serviced by faculty from diversified disciplines and coordinated by a director. Institutions which offer broad-based programs include: SIU/Edwardsville, Sangamon State University and Indiana University. The program at SSU includes no geology coursework. The alternative approach is an Environmental Studies program with a particular non-geologic orientation, i.e.. biology, natural resources, forestry, wildlife and fisheries or soil science. Examples of institutions offering this type of program include: Bemidji State, Mankato State and University of Wisconsin/Stevens Point. Thus, graduates from these programs will not qualify for the types of environmental work envisioned for graduates of the I.S.U. program. The proposed program

will focus on the factors necessary for an understanding of the hydrogeological parameters influencing environmental protection and groundwater resources.

21. Enrollment trends:

Because a program similar to that which is proposed is not offered elsewhere in the State, there are no enrollment trends available at the community, regional or State level.

Enrollment projections in this specific subdiscipline cannot be derived from numerical listings or published tables. Projections are attainable from logic, however.

(a) The proposed program could, in theory, have a considerably larger enrollment than the present undergraduate Geology major. It will not, however, because no circumstances are foreseen which would permit the expansion of the faculty-base to that which would be required to handle graduate students in numbers greater than 24.

(b) Once the program is established, it is projected that each first-year class of 12 or so full-time students will be comprised of four from I.S.U.'s Geology majors program, four graduates of quality programs from other Illinois institutions, e.g., U. of I., N.I.U., S.I.U., Augustana, plus four from out-of-state, including international graduates. (This distribution can be adjusted to meet the intrinsic priorities of a State-supported University.)

(c) The anticipated demand for enrollment is based upon the following:

1. The program serves a vigorous sub-discipline in which there is enormous need for fresh approaches in theoretical and applied research by professionals with academic credentials in all major categories of the sub-discipline.

2. There is currently a nationwide shortage of professionals (to say nothing of the international shortage) who are academically prepared with credentials to be the future researchers, administrators, and scientific investigators.

3. As stated elsewhere in this document, a baccalaureate degree in the sciences is not a professional degree. The U.S.A. has at least 120 universities with credible undergraduate programs in geology. If I.S.U. has a well-known, unique, highly respected master's program, as proposed, and in the specific professional area to which students are looking for a concentrated graduate degree, logic suggests that 12 annual admissions is a conservative projection.

22. STATEWIDE NEEDS AND PRIORITIES

The job market in the fields of groundwater resources and environmental geology already exists and a pattern of growth expected into the long future. Many of I.S.U.'s Geology majors over the past half decade have strongly favored geohydrology as career goals and nearly all have been placed. Several are with the State E.P.A., the State Water Survey or the Department of Energy and Natural Resources. Others are in the private sector nationwide. Many are in graduate schools. These placement successes have come in spite of the limited credentials attainable from the B.S. degree. The program should quickly gain national reputation for its format, and it is anticipated that its graduates will find employment opportunities from coast to coast and abroad.

On October 16, 1986, the Congress enacted the Superfund Amendments and Reauthorization Act of 1986. Section 311 of this Act specifically encourages:

> "Graduate training in the geosciences, including hydrogeology, geological engineering, geophysics, geochemistry and related fields necessary to meet professional needs in the public and private sectors and to effectuate the purposes of this Act."

Principal Employer Categories

--- Federal and State Environmental Protection Agencies
advisory services, preparation of specifications, compliance inspections, design criteria, site investigations

--- Environmental engineering companies.
design and supervision of operations, site studies for waste disposal, report writing for clients seeking EPA approvals, testing operations, supervision of borings, deep well waste disposal studies

--- Major waste disposal operators (federal, state, county, city and private).
supervision for adherence to regulations, operation of monitoring systems, compliance administration

--- Research laboratories for advanced environmental technologies.
scientific studies of new technologies in environmental systems and problem solving, research in improved monitoring devices and systems

--- Major construction companies and dewatering specialists.
services to firms which carry out heavy construction operations, scientific counsel to construction engineers in subsurface works

--- Private consulting firms, groundwater hydrology and environmental geology.
exploration for aquifers, pumping tests and evaluations, design of well fields, supervision of test drilling, wireline log interpretation, design of production wells, materials specifications, well yield enhancement, flow nets and analyses of groundwater migration, site studies for waste disposal, expert testimony in litigations

--- Drilling and well construction companies.
administration, supervision, materials designation, customer relations, business development, well performance tests

On or about June 30, 1987, the Illinois legislature passed an act initiated by the Governor entitled, GROUNDWATER PROTECTION ACT. This legislation is a culmination of recommendations by the Illinois Pollution Control Board, which in turn had received guidance from the Illinois Environmental Protection Agency and the State Water Survey. The Board had also conducted public hearings throughout the State in the summer of 1986.

The Act essentially addresses the vital role which groundwater plays in the economic welfare of Illinois and is designed to protect groundwater from contamination by pollutants and chemicals. It is a well established fact that most groundwater resources, once contaminants have infiltrated, are extremely difficult or impossible to rehabilitate in a short period of time. Thus derives the critical importance of protection. The enactment of this legislation places a heavy burden on the Department of Energy and Natural Resources, the I.E.P.A. and other State agencies, especially in the aspects of investigation, administration and enforcement.

The geology faculty of I.S.U. has contributed to the scientific and practical bases incorporated in the Groundwater Protection Act and have provided expert opinion to both the Illinois Pollution Control Board and the I.E.P.A. on matters pertaining to clauses of the Act.

The proposed graduate program is expected to yield professional-status expertise needed by the public agencies, as well as by the private sector industries which stand in the face of heavy penalties for failure to abide by the new Act. Graduates of the program will have absorbed a solid background in the principles of the new Act. Case studies related to groundwater protection will be used in Seminar course 488.

Appendix B contains letters in support of the proposed program and certify the job market in today's society.

FACULTY AND STAFF

23. Current faculty:

Five faculty members are involved in the undergraduate Geology program. All are on full-time regular appointments and will participate to some extent in the proposed graduate program. Two of the faculty, Foster and Nelson, have specific expertise and experience in environmental and groundwater geology and will be responsible for teaching some of the proposed core-courses. The other faculty will teach regular geology undergraduate courses, some of which may be selected as electives by graduate students. They will also serve on thesis committees and contribute to overseeing the program.

John W. Foster

Assistant Professor (and Acting Chairperson, Department of Geography-

Geology, Fall Semester, '87); A.B. Dartmouth College, 1947, M.S., Geology and Mining Engineering, The Ohio State University, 1950; three years active military service, seven years ready reserve U.S. Military Intelligence; joined ISU faculty in 1982 after 33 years domestic and international professional experience in 17 countries; formerly employed in industry and was a private consultant for 15 years to such clients as the U.S. Air Force Ballistic Missile Division, Bechtel and Ralph M. Parsons, State of California, Kern County Land Company, Signal Oil, Raymond International, Bank of America, International Engineering, U.S. Agency for International Development, United Nations and the Governments of Thailand, Saudi Arabia, Sudan, Cyprus, Egypt, U.A.E., Afghanistan, Libya and Greece; currently serves as the ISU-appointed Trustee of the Ohio River Basin Consortium for Research and Education.

Specializations in geohydrology, engineering geology, wireline geophysics, well design and geothermal energy; author of United States Patent #4,223,729, a method for creating a geothermal reservoir in deep, dry, massive rock for the recovery of thermal energy; author of 32 professional papers; honored by awards from the U.S. Department of Defense for his work in site selection for hardened missile silo programs, and from the Government of Kuwait for first successful exploration for fresh groundwater resources in that country, and design and supervision of construction of her first production water well.

Currently teaches introductory courses and 300-level geophysics, groundwater geology and engineering geology.

Richard R. Hart

Associate Professor; A.B. Cornell College, 1956, M.S. and Ph.D., University of Iowa, 1959 and 1963; joined ISU faculty in 1961; specializations in paleontology and oceanography. Research interests in marine microfauna in the Bahamas; currently teaches introductory courses, oceanography, paleontology, micropaleontology, tropical marine studies and field geology.

James G. Kirchner

Professor; B.S. and M.S., Wayne State University, 1960 and 1962, Ph.D., University of Iowa, 1971; joined ISU in 1969; exploration geologist for Gulf Oil Corp. in Libya and Nigeria, 1962-66; visiting professorships at Indiana University, 1979 and 1982, and at the University of Iowa, 1984; active consultant for asbestos analysis; specializations in mineralogy, igneous petrology and general petrology; particular research interests in Tertiary igneous intrusions in the Black Hills, S.D.; author of articles in state, national and international journals and publications; professional papers presented at state and regional meetings; official service ranks held in the National Association of Geology Teachers, 1976-79; currently teaches introductory courses, mineralogy, igneous and metamorphic petrology, optical mineralogy, ore deposits and field geology.

Robert S. Nelson

Associate Professor; B.A., Augustana College, 1965, M.S. and Ph.D., University of Iowa, 1968 and 1970; joined ISU in 1970; visiting professor at the University of Iowa and Bradley University; specializations in geomorphology, soils and environmental geology; active consultant to industrial clients on projects such as slope stability, dam stability, oil field development, water well contamination, monitor well installation, evaluation of bearing-strengths of subsurface materials to determine suitability for building foundations, EPA evaluation of highway corridors and evaluation of sewage treatment filtration problems; received grants from Illinois Department of Transportation, 1985; numerous co-leadership activities with the Illinois State Geological Survey; author and co-author of private consulting reports, state and regional field guides, articles in state publications, and two exercises in a published laboratory manual; numerous papers presented at regional and state professional meetings; official service ranks in the National Association of Geology Teachers, 1983-86, Illinois State Academy of Science, several years, Tri-State Geological Field Conference, 1985-88; currently teaches introductory courses, geologic techniques, geomorphology, glacial and Quaternary geology, structural geology and field geology.

Thomas K. Searight

Professor; B.A. and M.A., University of Missouri, 1951 and 1952, Ph.D., University of Illinois, 1959; joined ISU in 1959; two years with the Missouri Geological Survey working on surface and subsurface stratigraphy, and eleven summers with the Illinois State Geological Survey working on Pennsylvanian-age stratigraphy and coal resources; specializations in sedimentology, stratigraphy, coal resources and regional geology; author of articles on local and regional geology and on teaching activities in state, national and international publications; currently teaches introductory courses, sedimentology, stratigraphy, geologic techniques, geology of the U.S. and field geology.

Table IV-4

STAFF REQUIREMENTS FOR THE NEW PROGRAM
(IN STAFF YEARS)

LINE CODE	STAFF REQUIREMENTS	PAST YEAR	CURRENT YEAR	BUDGET YEAR	2nd YEAR	3rd YEAR	4th YEAR	5th YEAR
01	Fac./Admin total	0	0	4.605	4.605	4.605	4.2605	4.605
02	Admin.	0	0	0.25	0.25	0.25	0.25	0.25
	New			0.25	0	0	0	0
	Existing	0	0	0	0.25	0.25	0.25	0.25
03	Faculty	0	0	1.73	1.73	1.73	1.73	1.73
	New			1.73	0	0	0	0
	Existing	0	0	0	1.73	1.73	1.73	1.73
04	Grad. Assistants	0	0	2.625	2.625	2.625	2.625	2.625
	New	0	0	2.625	0	0	0	0
	Existing	0	0	0	2.625	2.625	2.625	2.625
05	Civil Service and Student Employees	0	0	0.82	0.82	0.82	0.82	0.82
06	Total Staff (02-05)	0	0	5.425	5.425	5.425	5.425	5.425

ASSUMPTIONS:

02 One-quarter time faculty administrator-adviser of graduate program, 12 months. (from existing faculty). Figure reflects 3 mo. summer duty.

03 Two new faculty at $50.00 (10 months), counted as $2 \times 1 \times \frac{10}{12} = 1.667$.

Plus adjunct faculty (lecturing attorney), counted as:
$1 \times \frac{4.5}{12} \times \frac{2}{12} = 0.0625$

04 Seven Graduate Assistants, 9 month. ($7 \times 0.5 \times .75 = 2.625$)

05 Student help = 20 hrs./wk. x 32 weeks x $3.35/hr.
Civil Service, Dept. Office, upgraded to two grade III from one grade II and one existing grade III.

Justification For New Faculty Lines:

One-quarter line is requested for twelve months annually for a program administrator/advisor. This line is needed for general supervision of the program, program administrative duties, program evaluation and graduate student advising, including general thesis and professional practice supervision. The advisor will be responsible for assuring the uniformity of style and quality required for all theses in the proposed program. It is expected the program's administrator/advisor duties will be assigned to a current faculty member by converting one-quarter of the present duties from instruction to administration and new faculty will take over the relinquished teaching load.

One and three-quarter lines are requested for regular, full-time instruction. These are needed in order to share the teaching of seventeen semester hours of additional courses the new program would institute. Current faculty are capable of teaching Groundwater Geology 360, Engineering Geology 362, Fluid Flow in Earth Materials 435, Groundwater Development and Resources Management 444 and Problems in Environmental Geology 456. However, the teaching loads of the present faculty are such that it would be impossible for them to add new courses without giving up some others. New faculty with expertise specifically in geochemistry and waste disposal are needed to round out the program, and with overlapping expertise in some of the other areas in order to share the over-all teaching load. They will participate in the direction of thesis research.

24. New Faculty Qualifications:

The new full-time faculty members must have combined specializations which qualify them to teach water geochemistry and the geologic aspects of waste disposal, as well as to teach some of the other courses in the proposed program and introductory courses in the undergraduate program. Applied field experiences, as well as demonstrated research activity and publication record, are essential. Contacts with government agencies and/or private industry are considered a definite asset, as are applied computer skills. In all likelihood, these positions would have to be filled at a senior rank to obtain individuals who have the required credentials.

In addition, a part-time position is sought for the teaching of one seminar each year. This position would be a 1/4 appointment for that semester only, preferably in the spring. The position would require credentials of a J.D. law degree and expertise in environmental law and water rights. The purpose of this position would be to teach a seminar in environmental and water law, specifically as it applies to geological problems.

SUPPORT SERVICES

25. Current Equipment and Instructional Materials:

In the category of large equipment, the undergraduate program has an X-ray diffractometer, which is principally used for mineral identification. It can be used in the proposed program particularly for the identification of clay types in studies involving permeability barriers to groundwater movement

and in clay-expansion studies.

In terms of medium to small-sized equipment, the current program has items commonly used in various sedimentological studies, most of which will have periodic application in the proposed program, particularly in research projects. This includes 1) a Chiddix apparatus for determining calcite-dolomite proportions; 2) a vacuum oven for drying and impregnating sediment samples; 3) rock saw and thin-section preparation equipment; 4) binocular microscopes; 5) petrographic microscopes; 6) a Franz magnetic separator; 7) Vreeland spectroscope; 8) sediment sieving equipment; and hand-operated coring tools.

Computer equipment is inadequate, consisting of two small (TRS-80) computers with small printers. Other equipment within the department, but acquired by the Geography program, includes a digitizer and complete cartographic and darkroom facilities.

Additional Equipment Needed:

Some additional equipment is needed to carry on major research projects on levels compatible with a graduate program. Two constant-head permeameters are needed with support apparatus, peristaltic pumps, well-head monitoring equipment, high-pressure tanks and controls, and water-testing kits. If the program is to be state-of-the-art, then computer facilities also will need to be available for graduate student and faculty research use. It is proposed the program acquire two hard-disc, 2-megabyte computers with ten satellite work stations. To accommodate the computer modeling, $20,000 is requested in the budget for two megabyte computers with ten work stations and supporting software. Software programs for modeling groundwater flow are necessary and currently cost $3200. Software for data presentation and statistical analyses would also be needed.

Contractual Needs:

A unique aspect of the proposed program is to provide students with an abundance of practical field experience. An important part of field experience is for the students to develop a working knowledge of well-drilling techniques, methods of recording subsurface drilling data and methods of obtaining information on water levels, drawdown and formation-fluid pressures. In order to accomplish these objectives, it is proposed that each year drilling contractors be hired to drill three wells each year, using the three major drilling techniques: hollow-stem auger, air rotary and mud rotary. The first series of wells would be drilled on the University Farm*, with a side benefit of augmenting their present water supply. Other wells could be drilled for research studies and, frequently, in locations which would benefit the community. The University would need to maintain access and monitoring rights to all wells. Costs are estimated on anticipated depths of 150 feet, at $11/ft., and include completion.

* Memorandum from ISU Department of Agriculture is included in Appendix A, p. 29B.

Space Needs:

Additional space beyond that which is presently available to the Geology section of the Department is necessary for accommodation of the proposed Graduate Program. Square footage figures are approximate.

Wet Laboratory (600 ft^2), for permeameter equipment, testing work in hydrodynamics, adsorption experiments, granular filtration research, gas injection experiments and other advanced research.

Wet Materials Laboratory (600ft^2), for layout and analyses of drill cuttings and cores, housing diamond saw and mini-coring equipment, sieve shaker and all other essentially-dry work on rock and soils.

Clean Laboratory (660 ft^2), for project research on surface and subsurface geology, computer modeling, layout of maps, drill-sample logs, geophysical logs, stratigraphic correlations, geophysical data reduction and plotting.

Graduate-student Drafting Room (400 ft^2)

Graduate Assistants' Space (6 x 60 ft^2)

Faculty Office Space including small research area (2 x 220 ft^2), for the two supplemental faculty in Program format.

Dedicated Lecture Room, table equipped for 20 students (600 ft^2)

NOTE: (A) Reasonable physical separation from Geology's present facilities in Schroeder Hall is acceptable.
(B) Use of certain of the listed facilities by undergraduate majors would be possible, yielding to Graduate-student priority.

26. Library Holdings:

The library currently has and receives a variety of journals and books in support of the undergraduate geology program. The library is also a repository for federal documents, thus it receives all of the U.S. Geological Survey and federal government water supply and environmental publications. However, it does not receive many of the journals specifically targeted for groundwater, waste disposal and environmental research. Sixteen additional journal subscriptions are needed, along with microfiche copies of some back volumes. Approximately sixty additional books are also needed.

27. Internship/Co-op Program

Participation in a professional practice experience (internship or co-operative) will not be required, but will be encouraged. Projects with the Illinois Environmental Protection Agency and the Illinois State Water Survey will be available. Other positions will be sought with engineering firms as the program grows. It is anticipated that some of these experiences will develop into thesis projects.

28. Not applicable.

ACCREDITATION AND LICENSURE

29. There is no nationally recognized academic accreditation in the geological sciences at the graduate level. Professional licensing is on a state by state basis. California was the first State to legislate requirements that limit professional services in engineering geology and groundwater to holders of an issued license. A few other primarily western states have followed suit. Illinois has enacted no license requirement in this profession, but is likely to do so in due time.

30. Not applicable.

31. The proposed program will be administered by the Department of Geography-Geology, which offers undergraduate degrees in both fields of its namesake. Neither undergraduate program comes under the auspices of an accrediting or licensing body. The I.S.U. B.S. degree, for Geology majors, is nationally accepted by graduate schools.

FINANCING

32. Table IV-5 shows projected program costs.

Table IV-5 TOTAL RESOURCE REQUIREMENTS FOR THE NEW PROGRAM REQUEST

($ thousands)

LINE CODE		BUDGET YEAR FY89	2ND YEAR FY90	3RD YEAR FY91	4TH YEAR FY92	5TH YEAR FY93
O1	Total Resource Requirements	242.56	242.56	242.56	242.56	242.56
O2	Total Resources Available from Federal Sources	0.00	0.00	0.00	0.00	0.00
O3	Total Resources Available from Other Non-State Sources	0.00	0.00	0.00	0.00	0.00
O4	Existing State Resources	0.00	242.56	242.56	242.56	242.56
O5	State Resources Available Through Internal Allocation	0.00	0.00	0.00	0.00	0.00
O6	New State Resources Required (O1 minus the sum of O2-O5)	242.56	0.00	0.00	0.00	0.00

Breakdown of the figure on Line O6 of the budget year:

O7	Staff	159.81
	Admin/Other Professional	6.30
	Faculty	105.00
	Graduate Assistants	40.95
	Civil Service	5.42
	Student Employees	2.14
O8	Equipment and Instructional Materials	44.90
O9	Library	6.85
10	Contractual Services	25.50
11	Other Support Services	5.50
	Commodities	0.00
	Printing	0.00
	Telecommunications	0.00
	Travel	5.50
	Awards and Grants	0.00

32a. Projected costs are not expected to increase in increments.

32b. New State Resources:

The total new resources requested are broken down and shown in lines 07-11 of Table IV-5. Each of these lines is explained as follows:

Line 07 - Staff: This includes salary for two senior (full-Prof rank) faculty for nine months/year, at the rate of $50,000 each. It also includes seven graduate assistants with an average salary of $650/mo. x 9 mo. each, and student help, the latter figured for 20 hours/week for 32 weeks annually. A salary of $5,000 is figured for an environmental attorney to teach a seminar on environmental law once each year and $6300 for the one-quarter summer appointment of the administrator/advisor.

Line 08 - Equipment, etc.: Some specialized laboratory equipment is needed for the program, totaling $5900. This includes permeameters, peristaltic pumps and high-pressure tanks, all used for studying fluid flow through earth materials. Also included is well monitoring equipment. Graduate students and faculty will need computer equipment for modeling groundwater flow and contaminant dispersion, and for statistical calculations, data processing and word processing. $20,000 is allotted for two 2-megabyte computers with ten satellite work stations and two printers.

State of the art computer simulation of groundwater movement and contamination migration are based on the Pricket-Longquist models. Those models are written to run on IBM 60 series 2 meg. R.A.M. and 40 meg. storage or similar systems, such as DEC-VAX. These systems permit networking with a CPU and up to 20 terminals or work stations.

A van is requested, at $19,000, to haul equipment and students to field project sites.

Line 09 - Library: Approximately 60 new books (average $40 each) will be needed, along with microfilm and microfiche copies of back issues (to 1980) of journals pertaining to water resources, waste management, groundwater and environmental concerns. Included is $2450 for subscriptions to new journals at Milner Library.

Line 10 - Budget encompasses $300 for additional telephone calls; $2000 for printing costs which will be used for printing fliers advertising the program, photocopying for research, etc.; and $2000 for miscellaneous expenses, which would include increases in the current mail budget, equipment repair, etc. $10,500 is requested for well-drilling activities described in answer #25 above. Computer software packages are itemized at $7000, with the groundwater modeling software alone priced at $3200. For mainframe computer access: $4000.

Line 11 - Other: $5500 is included for travel, inasmuch as faculty will need to inspect field theses projects, periodically visit places like the IEPA and ISWS and check on various professional practice projects and arrangements. Class field trips to visit well projects and to inspect environmental problems

are also anticipated.

33c. Federal Support:

Federal funding through E.P.A. grants and other Government sources will be sought. No levels of federal program assistance are assumed in Table IV-5, although the Superfund program may enable support in scholarships and research grants.

APPENDIX A

UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO

SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF LAND, AIR AND WATER RESOURCES

HOAGLAND HALL
DAVIS, CALIFORNIA 95616

September 10, 1987

FACULTY POSITION ANNOUNCEMENT
in Geohydrology
University of California, Davis

Title: Assistant/Associate Professor and Assistant/Associate Geohydrologist in the Agricultural Experiment Station in the Department of Land, Air and Water Resources. This is an eleven-month (plus one month paid vacation) tenure-track position in the College of Agricultural and Environmental Sciences consisting of teaching and research responsibilities.

APPENDIX A

Illinois State University
College of Applied Science and Technology
Department of Agriculture

TO: Jim Kirchner
Department of Geography-Geology

FROM: R. D. Henry, Chairperson RDH
Department of Agriculture

DATE: April 8, 1986

RE: Research Wells on the ISU Farm

The Department of Agriculture has agreed to permit the Department of Geography-Geology to construct water wells on the ISU farm for research purposes. The location of the wells on the farm must receive final approval of the Department of Agriculture Chairperson before any construction is initiated.

RDH:bjt

Normal-Bloomington, Illinois
Phone: 309/438-5654

150 Turner Hall
Normal, Illinois 61761-6901

APPENDIX B

Quality of Undergraduate Geology Programs

The following quotes are excerpts from an independent evaluation of the undergraduate Geology program by Dr. Lee J. Suttner (Indiana University) and Dr. John C. Mann (University of Illinois), dated October 1, 1984.

"In our interviews with administrators, faculty and students one impression is foremost. The geology program's primary strength is its people and its uniquely positive esprit de corps. The faculty is close-knit, harmonious, dedicated and hard-working. Students have formed close personal bonds with each other and with the faculty. A special pride and good feeling about what is going on exists on the part of both the faculty and students."

"Accepting the data of an internal Geology faculty report (Program Review for Bachelors Degree in Geology: ISU 1982-83) as accurate, the success of job placement for the seniors graduating with bachelors degrees in geology from ISU is well above the national average. This probably reflects the faculty's success in providing a broad based, practical education with special emphasis on field work. When the students graduate they can indeed do geology as evidenced by their employment in a variety of state agencies and industry both in and outside of the state of Illinois."

"We are especially impressed by the faculty's covert attempts to integrate exercises in their courses which demand rigor in both technical writing and speaking."

"We feel that the program is a viable, productive asset to geologic education in general, but especially to the liberal education of ISU students as a whole."

"The program's mission is unique and well-focused on practical, field-based instruction qualifying undergraduates for employment upon graduation."

The following pertinent paragraphs are excerpted from a letter from Dr. Morris W. Leighton, Chief, State Geological Survey, Urbana:

March 26, 1986

Dr. John W. Foster
Faculty of Geology
Illinois State University
College of Arts and Sciences
Department of Geography-Geology
Normal-Bloomington, IL 61761-6901

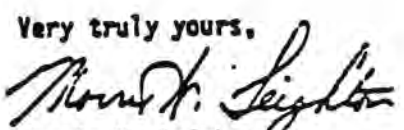
Dear Dr. Foster:

I am very pleased that Illinois State University is proposing a designated Master of Science Degree in Geohydrology and Environmental Geology. There is a great need for well-trained graduates in these fields, especially Hydrogeology. The demand presently is much greater than the supply of technically competent scientists.

25 - Appendix

The Geological Survey supports the addition of this important field to the curriculum at Illinois State University. I'm sure your graduates will be in strong demand.

Very truly yours,



Morris W. Leighton
Chief

MWL:pj

STANG HYDRONICS INC.
787 No. Main Street, P.O. Box 5787
Orange, California 92667-0767
(714) 639-9531
TELEX 67-8371
Calif. Contractor's License #394815

April 2, 1986

Professor John W. Foster
Faculty of Geology
Illinois State University
Schroeder 206
Normal, Illinois 61761-6901

Dear John:

First, I'd like to apologize for my delayed response to your letter of March 14th. So far, this year has been moving at a rather frantic pace, so I've been out of the office quite a bit. I hope that this hasn't inconvenienced you.

On a conceptual level, I think that the program being proposed will provide the graduate with a unique tool for building a career in an area that can only grow in the years to come. We face tremendous challenges in the present and in the foreseeable future in the location, maintenance, and monitoring of our groundwater resources. This is especially keen here in the southwest. It has been my experience that the majority of this type of work is being conducted and/or overseen by civil engineers and elected county-level officials. While this makes for a good team in building dams, pump stations, and disposal sites, there seems to be a pervasive lack of understanding of the consequences of such endeavors on the groundwater systems they hope to (or hope not to) influence. This is an area that I feel needs a heavy infusion of the science of hydrology. We have the know-how for mind-boggling projects; we need to develop the know-what.

I read your attached course descriptions with a great deal of enthusiasm. The program will indeed be quite rigorous, and its graduates will have picked up something beyond the science along the way. Discipline. In order to complete the requirements for both a Bachelor's Degree and the proposed Master's Degree, the student will have had to develop a sense of timing and priorities. This will require dedication and discipline, as well as a willingness to work and work hard.

The content of the core courses appears to provide a strong base from which to tackle the challenges I mentioned earlier. My work in construction dewatering has a very limited application of the science per se, in that we design well or wellpoint systems for locally and temporarily disrupting

specific target aquifers or aquifer systems. Yet there have been many occasions when I have had to find references in some of the very subjects covered in the courses proposed.

Overall, I feel that the program under consideration will be an asset to both the Department and to the University. The graduates of such a program will possess some unique credentials to offer in an area that is sorely deficient in qualified expertise. This is coming at a time when such expertise is rather urgently required.

Inappropriate and personal comments ommitted.

Sincerely,

STANG HYDRONICS INC.

Rick

Richard J. Scott
Engineering Geologist

RJS:bjs

Waste Management of North America, Inc.
3003 Butterfield Road · Oak Brook, Illinois 60521

October 8, 1986

R.S. Nelson, PhD
Illinois State University
Department of Geography-Geology
Normal, Illinois 61761

SUBJECT: Master of Science in Environmental Geohydrology Program

Dear Dr. Nelson:

I am writing this letter in total support of establishing a graduate program at my alma mater which offers a degree as a Master of Science in Environmental Geohydrology.

Since I graduated from ISU in 1974, I have worked in the field of environmental geohydrology for the Illinois Environmental Protection Agency, United States Environmental Protection Agency, and now with Waste Management of North America, Inc.

One of the objectives of any academic program is the successful placement of graduates in professional positions in areas in which the graduates have received training. I assure you that the need for environmental geohydrologists will continue to increase in the future. Specific training in hydrology, geochemistry, engineering geology, and geomorphology are necessary to develop a discipline in environmental geohydrology.

Indeed, the need for qualified geohydrologists in the environmental field has been, is currently, and will continue to grow. The societal demand for the protection and enhancement of ground water and surface water quality will not diminish. This demand has been translated into Federal laws such as the Resource Conservation and Recovery Act, Safe Drinking Water Act, Superfund, etc. as well as numerous State laws which are designed to protect or remediate the deterioration in the quality of water resources in the United States. The proper implementation of these various environmental laws weighs heavily on the discipline of geohydrology.

I wish you success with this very important program and assure you my continuing support.

Sincerely,

C. T. Grigalauski

Charles T. Grigalauski, CPG
Manager-Environmental Management

CTG:plb

312/654-8800 · Telex: 253094 · Twx: 910-651-0029