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Adaptation of The General AASHO Road Test Equation To Arkansas Conditions

Final Report

THE ARKANSAS STATE HIGHWAY DEPARTMENT

PLANNING AND RESEARCH DIVISION

In Cooperation With

THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, BUREAU OF PUBLIC ROADS

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ABSTRACT

Adaptation of The General AASHO Road Test Equation To Arkansas Conditions, Final Report, by E. W. LeFevre and W. L. Heiliger; Civil Engineering Department, University of Arkansas; Highway Research Project No. 20; June 1970.

Pavement serviceability and deflection characteristics were determined for 27 test sites on various Arkansas highways. The CHLOE profilometer was used to quantitatively rate the serviceability of the test sections. The Benkelman beam, equipped with a recorder to provide a continuous analog trace of the deformation curve, was used as an indicator of pavement composite strength. Areal and linear parameters of the deflection curve charts were determined.

The serviceability measurements did not indicate any definite trends for the two measurement periods. A mathematical model was developed to describe Benkelman beam deflection traces. The deflection parameters were used to determine the resistance of pavement components to sharp curvature (stiffness). A procedure to evaluate the AASHO material coefficients by the use of the stiffness coefficients was presented.

California R-value determinations were made for various groups of Arkansas soils. Granular materials (crushed stone, sand, gravel) exhibited statistically constant R-values for each group. A modification of the test procedure was suggested to allow complete saturation of silt soils. There was no noticeable correlation between the R-value test results and the AASHO material coefficients.

ADAPTATION OF THE GENERAL AASHO ROAD TEST EQUATION TO ARKANSAS CONDITIONS

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of

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for

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LIST OF REPORTS

HIGHWAY RESEARCH PROJECT NO. 20

The following reports were prepared under the direction of Dr. Edward C. Grubbs and submitted to the Arkansas Highway Department.

Interim Technical Report 1: "A Review of Literature Pertaining To The Development, Subsequent Evaluations and Current Use of the General AASHO Road Test Equation," by E. C. Grubbs, January 1965.

M.S. Thesis: "A Correlation Study of the AASHO Soil Classification System and Group Index With Stabilometer R-Value," by J. K. Knight, January 1966.

Interim Technical Report 2: "A Correlation of California R-Value and AASHO Group Index For Arkansas Soils," by E. C. Grubbs and F. L. Roberts, May 1966.

M.S. Thesis: "A Correlation Study of the AASHO Coefficients of Relative Strength For Pavement Components With Stabilometer R-Values," by C. W. Garner, January 1966.

In June 1966, Dr. E. W. LeFevre was appointed as the Principal Investigator of the research project. Under his direction, the following reports were prepared and submitted.

M.S. Thesis: "A Further Correlation Study of the AASHO Coefficients of Relative Strength of Flexible Pavement Components with California R-Test Values Using Unstabilized Base and Subbase Materials From Arkansas," by L. C. Doyle, June 1967.

M.S. Thesis: "An Investigation of the Atterberg Limits and Gradation of Arkansas Soils as Parameters of the California R-Vlaue," by J. D. Vest, January 1968.

M.S. Report: "An Investigation of the Factors Related To The Correlation of R-Values With Pavement Coefficients and Soil Support Values," by P. K. Clements, June 1967.

M.S. Thesis: "A Determination of the Soil Support Value for Arkansas Soils Using Common Soil Characteristic Tests," by E. D. Erwin, August 1968.

M.S. Thesis: "An Investigation of the Benkelman Beam Deflection Test Parameters," by P. T. Shafer, August 1969.

Interim Technical Report No. 3: "Benkelman Beam Deflection Test Parameter Investigation on Arkansas Highways," by E. W. LeFevre, W. L. Heiliger and P. T. Shafer, January 1970.

Interim Technical Report No. 4: "CHLOE Profilometer Measurement Sensitivity," by E. W. LeFevre, W. L. Heiliger and D. L. Thomasson, August 1970.

Interim Technical Report No. 5: "Field and Laboratory Data Summary," by E. W. LeFevre, W. L. Heiliger, and L. L. Gaddy, Jr., August 1970.

Final Report: "Adaptation of The General AASHO Road Test Equation to Arkansas Conditions," by E. W. LeFevre and W. L. Heiliger, June 1970.

SUMMARY

Subsequent to the completion of the AASHO Road Test and publication of the findings, a satellite study was organized to adapt the AASHO design procedures to Arkansas conditions. The research was oriented toward (1) evaluation of the group index/soil support relationship, and (2) establishment of pavement design coefficients for Arkansas flexible pavement components.

Soil materials were tested with respect to gradation analysis, Atterberg limits, and California R-value. Serviceability ratings and deflection characteristics were determined for highway pavement sections. The CHLOE profilometer was used to evaluate the pavements' serviceability and the Benkelman beam was used as an indicator of composite strength.

Test results did not yield a valid relationship between group index and soil support values. A mathematical model was developed that related gradation, void ratio, and plasticity index to the soil support. In the course of this development, a procedural change was recommended for R-value testing to enhance soil saturation. Granular materials (gravel, sand, and crushed stone) exhibited statistically constant R-values for each group. An investigation of high strength pavement components disclosed that the R-value test equipment and procedure is not valid for materials which possess high resistance to lateral deformation.

The narrow range of R-values exhibited by the AASHO Road Test materials precluded the determination of any relationship of these materials and Arkansas materials. The serviceability measurements indicated no significant trends to relate pavement deterioration and applied loads during the two year test period. A general mathematical model was developed to describe the strain curves produced by the recorder of the Benkelman beam. The deflection characteristics were used to determine the pavement components' properties to resist bending deflection (stiffness).

A review of the stiffness coefficients and the pertinent data for each test section indicated the validity of the stiffness analysis. The results of this research did not warrant any suggested modification of the AASHO pavement design procedure. It was concluded that deflection research to evaluate the design, materials, and construction methods would be beneficial.

ACKNOWLEDGEMENTS

The report contained herein was prepared at the University of Arkansas under the direction of the authors by the research staff of Highway Research Project No. 20. The authors wish to acknowledge the contributions of the many graduate assistants during the six year duration of this research. Mr. Robert Kessinger of the Division of Planning and Research, Arkansas Highway Department, is the project coordinator, and Mr. B. K. Cooper, Chief Engineer, is the chairman of the research subcommittee.

This report was prepared in cooperation with the U.S. Department of Transportation, Federal Highway Administration, Bureau of Public Roads. The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Arkansas Highway Department or the Bureau of Public Roads.

CHAPTER I

CONCLUSIONS AND RECOMMENDATIONS

Based on the research findings described in the following chapters, the authors submit these conclusions and recommendations:

Conclusions:

1. The results of highway performance measurements with the CHLOE profilometer cannot be used to determine yearly losses of serviceability. The response of the serviceability equation was not sensitive to small changes of the quantities over the two year period. (IV,20)*
2. It is not possible to relate the subgrade soil support values to the group index values without large margins of error. (IV,14)
3. Soil support values can be predicted from routine laboratory tests; i.e. Atterberg limits, gradation analysis, specific gravity and compaction characteristics. (IV, 14)
4. Granular materials (gravel, crushed stone, and sand) possess statistically constant R-values for each material group. (IV, 17)
5. The R-value test equipment and procedure is not valid for materials that exhibit greater lateral resistance to movement that does crushed stone. (IV, 18)
6. Insufficiency of data precluded the utilization of a factorial analysis to study the AASHO material coefficient designation for Arkansas materials. (IV,20)

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* Refer to the chapter and page number, respectively, for discussion of this conclusion.

7. The material stiffness coefficients that were determined for pavement components describe their properties to resist bending deflection. (VI,36)
8. The mathematical deflection model for layer systems adequately describes the pavement deflection. (V,24)
9. The mathematical model used to describe the continuous analog traces of the Benkelman beam is an adequate representation. (V,27)
10. Computer programs discussed within the text are not submitted with this report because of the lack of compatibility of computer facilities.
11. Based on the results of this research, no modifications are recommended for the AASHO design procedure.

Recommendations:

1. Future pavement research projects should have actual traffic studies (when required for analysis) rather than estimated data. (appendix C,84)
2. The R-value test procedure should be changed for silt soils to allow complete saturation of the soil sample. (IV,16)
3. The construction of specifically designed test sections for future pavement design evaluation studies would be beneficial.
4. Strict control of pavement structural components' placement and methods of manipulation should be followed.
5. The use of the AASHO design procedure with the presently assumed values for Arkansas materials is recommended for highway design.

6. Validation or modification of the AASHO design procedure from continued research based on the stiffness properties of pavement components is suggested.

7. The purchase of a dynamic deflection measuring instrument is recommended to assist in the evaluation of pavement performance. If possible, the electronic sensors should be spaced at six inch intervals within the initial distance of two feet from the load. The location of a sensor under the center of the load would be beneficial.

8. The determination of the ambient and pavement surface temperatures during deflection measurements should be included in future studies.

9. Moisture regime and placement characteristics of the pavement components should be determined at the time of deflection measurements.

CHAPTER II

HIGHWAY RESEARCH PROJECT 20

The AASHO Road Test at Ottawa, Illinois, was the third (Refs. 1 and 2)* full scale test of pavement behavior under controlled truck traffic to be administered by the Highway Research Board. This test program was conceived and sponsored by the American Association of State Highway Officials as a study of the performance of highway pavement structures.

Results from the AASHO Road Test were statistically analyzed and a subsequent "recommended design procedure" (Ref. 3) was published. The intent was not to establish a universal design equation, but to report general performance/design relationships as indicated by the road test. To this end the final AASHO report contained the following caution:

> Generalizations and extrapolations of the findings to conditions other than those that existed at the Road Test should be based upon experimental or other evidence of the effects on pavement performance of variations in climate, soil type, materials, construction practices, and traffic. (Ref. 4)

Utilization of the design procedure by the individual state highway departments would require modifications for different materials, test procedures, climate, and loadings.

In an effort to utilize current technology, the Arkansas Highway Department, in cooperation with the Bureau of Public Roads, authorized a pavement performance study - satellite to the AASHO Road Test - to adapt the general AASHO Road Test equation to Arkansas conditions. The

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*Refers to the number of the referenced publication in the bibliography.

contracting agency authorized to conduct the investigation, Highway Research Project No. 20, was the Civil Engineering Department of the University of Arkansas. The scope of the research project was divided into three phases: I., to investigate the possibility of obtaining soil support values from the group index; II., to study the estimated values for coefficients of pavement components, to evaluate their applicability to Arkansas conditions, and to establish values of new coefficients for Arkansas materials; III., to review, verify, and/or modify the results obtained in Phases I and II by analyzing the results of field observations and laboratory test data (Ref. 5). These three phases are discussed in the following paragraphs.

The accomplishment of Phase I required the sampling of various types of material throughout the state that might be used as highway subgrades. Laboratory tests of the soils were used to determine the group index and the modified resistance value, California R-value (refer to Ref. 6 for description of the R-value test). Since soil resistance (to lateral deformation) had been previously correlated with soil support (Ref. 7), the degree of association between group index and soil resistance would have provided an indication of the validity of obtaining soil support values from the group index numbers. If the prediction of soil resistance from the group index proved inconsistent, an alternate procedure of using the R-value test would be proposed.

The purpose of Phase II was to study the coefficient values of pavement components. Evaluation of the applicability of the AASHO coefficients to Arkansas conditions and establishment of values for Arkansas materials was to be determined mathematically. If possible, the curve of best fit relating the R-value of pavement components to the coefficients for the Road Test materials would be determined, and a prediction curve relating R-value and component coefficients would allow determination of coefficients for Arkansas materials. These materials were chosen from sources that were in current use by the Arkansas Highway Department.

Phase III was the field investigation of the composite strength and loss of serviceability of flexible pavements. From the results of Phase III, refinement, modification, and/or verification of the intermediate results from Phases I and II were primary objectives. Composite strength was indicated by pavement deflection parameters as measured by the Benkelman beam and serviceability was rated by the CHLOE profilometer.

Portions of existing pavements were selected for detailed study with respect to the strengths and thicknesses of pavement materials, the accumulated equivalent 18-kip axle loads carried by the pavements, the time intervals over which the axle loads were accumulated, and the serviceability indices of the pavements. These variables were selected on the basis of their interrelationships exhibited in the results of the AASHO Road Test.

Test site selection was based on these criteria; (1) approximate length 2100 feet; (2) exclusion of sections involving large cuts and changes from cuts to fills in the construction process; (3) horizontal and vertical curves and drainage structures were avoided when possible. A total of 37 test sites were initially investigated. For various reasons (refer to Appendix A), the loss of 10 test sites occurred during a three year period.

A full factorial experimental design was proposed. The primary control variables were the strengths and thicknesses of the various pavement components. The secondary control variables were the accumulated axle loads and the time over which the axle loads were applied. The performance serviceability index was the single response variable.

Highway Research Project No. 20 was approved June 1, 1964, for a period of five and one-half years. A six month extension was granted to allow additional time for data analysis and conclusions.

CHAPTER III

AASHO ROAD TEST

The AASHO Road Test near Ottawa, Illinois, was conducted during a two-year period to provide research data useful in the design of serviceable highways at minimal cost (Ref. 8). Highway designers acknowledged the association between pavement structure and the magnitude and frequency of loads, but not in a quantitative relationship. The scope of the project was limited to a few important variables (as recommended by highway engineers) in an effort to obtain maximum usable data. Statisticians served in an advisory capacity during design and analyzed the data upon completion of testing.

The objectives of the AASHO Road Test related to flexible pavement design were (Ref. 8):

(1) To determine the significant relationships between the number of repetitions of specified axle loads of different magnitude and arrangement and the performance of different thicknesses of uniformly designed and constructed asphaltic concrete on different thicknesses of bases and subbases when on a basement soil of known characteristics;

(2) To make special studies dealing with such subjects as paved shoulders, base types, pavement fatigue, tire size and pressures, and heavy military vehicles, and to correlate the findings of these special studies with the results of basic research;

(3) To develop instrumentation, test procedures, data charts, graphs, and formulas, which would reflect the capabilities of the various test sections, and which would be helpful in future highway design in the evaluation of the load carrying capabilities of existing highways.

Six test loops were constructed and subjected to various traffic loads. The design of the tangent sections of the loops was varied in the thicknesses of surface, base and subbase. Extreme caution was exercised during construction to assure conformity of the test sections with the design specifications.

The principle objective of the AASHO Road Test required determination of relationships between performance under specified traffic and the design structure of certain pavements (Ref. 9). The pavement serviceability was defined as the ability of a pavement section to serve traffic. Performance was related to the pavement serviceability over a period of time; i.e. a decrease in serviceability was inferred as a decrease in pavement performance.

A rating panel was chosen from all areas of interest in highways to rate existing pavement sections with regard to the present ability to serve traffic. Results from the rating panel were compared with measured physical quantities and the following mathematical combination of variables was determined to represent the Present Serviceability Index (PSI)(Ref. 9):

$$PSI = 5.03 - 1.91 \log(1 + SV) - 1.38\ RD^2 - 0.01 \sqrt{C + P} \qquad \text{(Eq. 1)}$$

SV - mean slope variance

RD - average rut depth

C + P - cracking and patching per 1000 ft^2

The term Slope Variance (SV) is the summary statistic of wheel path roughness as measured by a longitudinal profilometer.

The relationships between traffic serviceability and component thicknesses were described by the general AASHO Road Test equation (Ref. 4):

$$G = \log \frac{C_0 - P}{C_0 - C_1} = \beta(\log W - \log \rho)$$

G - a function (the logarithm) of the ratio of loss in serviceability at any time to the total potential loss

β - a function of design and load variables that influences the shape of the P vs. W serviceability curve

W - weighted traffic factor

ρ - a function of design and load variables that denotes the expected number of axle load applications to a serviceability index of 1.5

P - serviceability at a given time

C_0 - initial serviceability value, and

C_1 - serviceability level (1.5) at which test sections were removed from the test.

For weighted load applications,

$$\beta = \frac{0.40 + 0.081(L_1 + L_2)^{3.23}}{(SN + 1)^{5.19}\ L_2^{3.23}}$$

and

$$\rho = \frac{10^{5.43}\ (SN + 1)^{9.36}\ L_2^{4.33}}{(L_1 + L_2)^{4.79}}$$

in which

L_1 - load on one single-load axle or on one tandem-axle set, in kips

L_2 - axle code, 1 for single, 2 for tandem

SN - structural number = $a_1D_1 + a_2D_2 + a_3D_3$

a_1, a_2, a_3 - coefficients determined in the Road Test

D_1, D_2, D_3 - thickness of surface course, base course and subbase, respectively.

Evaluation of the constants and determination of exponential powers were possible because of the experimental design procedure employed. Results of the estimation of the pavement component coefficients (a_1, a_2, a_3) were published for the specific materials used in the construction of the Road Test.

Utilization of the general AASHO Road Test equation for pavement design required evaluation of several factors pertinent to a geographic location (usually a state). These factors were; terminal serviceability index, soil support value, equivalent daily 18-kip axle load applications, and regional factors.

The design (terminal) serviceability index was defined as the expected serviceability of the sections at the end of a specified design period. The value depended upon the classification of the pavement utilization; i.e. 2.5 for major highways, 2.0 or 1.5 for secondary roads. This quantity is a function of a cost-benefit ratio.

The soil support value was representative of the strength of the subgrade material. The implications were; the stronger the basement soil the less the thickness of overlaying components required to distribute the imposed stresses to a tolerable level. Various correlations exist between soil support values and established soil tests (Ref. 7).

The volumetric traffic analysis is an estimate of traffic conditions for the expected life of the road. Traffic was divided into weight groups, and the volume of each weight group was multiplied by an equivalence factor (refer to Appendix C). The summation of this product predicted the mean equivalent daily 18-kip single-axle load applications.

The regional factor was included to modify the structural number according to climatic and environmental conditions other than those that existed at the Road Test.

The above four fundamental design variables were related in the following manner: the required structural number (SN) was a function of the soil support value, the equivalent daily 18-kip single axle load applications and the serviceability index at the end of the design period. The less the value of soil support, the greater the load applications, and/or the higher the serviceability index, the greater the structural number required to satisfy these conditions. According to the adversity of the regional climate and environmental effects upon the pavement components, the structural number was adjusted by the regional factor to yield the weighted structural number ($\overline{SN}$). Regional factors greater than one (1.0) proportionally increased the weighted structural number. Design of pavement component thicknesses would be a process based on economic evaluation of minimum expenditure.

CHAPTER IV

RESEARCH FINDINGS

This chapter is a synoptic presentation of the results obtained from the research performed by the personnel of Highway Research Project No. 20. Most of the information has been the subject of previous reports (as indicated by reference numbers) submitted to the Arkansas Highway Department.

Phase I

The soil support value is an abstract value representative of the basement soil strength. Determination of the structural number, and consequently the required layer thickness, depends upon the evaluation of the soil support of the subgrade. The use of this term was introduced by the AASHO design group and is not the subject of extensive studies in the field of soil mechanics or highway engineering. In actuality, the Road Test established two values of soil support; i.e. a value of three (3.0) was assigned to the embankment material at Ottawa, and a value of ten (10.0) was assigned to crushed rock. The crushed rock soil support indication was taken from a test section of thick base material of crushed rock. The effect of the subgrade was considered negligible for this section. All other possible values were estimated to be within the scale determined by linear interpolation between the two established values and extrapolation below three (3.0) (Ref. 10).

After the publication of the AASHO design procedure various organizations correlated the soil support value with other soil tests and index values. The scope of Phase I was to establish the degree of relationship between group index and soil support value. Since R-value and soil support values indicated high correlation, it was concluded that a group index/R-value relationship (if existent) could be used to imply soil support values.

Soil samples were collected from 21 of the 75 counties in Arkansas. A total of 159 samples were analyzed and the group index and R-value determined for each soil. Attempts to establish mathematical models yielded no relationships suitable for accurate prediction of R-value from the group index. Since group index was an abstract value, it was dropped from the analysis and attempts were made to relate R-value and the results from the routine soil tests; i.e. Atterberg limits and gradation. The statistical analysis for the prediction of the R-value from soil tests produced large confidence bands. It was recommended that a conservative design curve be temporarily used until the Arkansas Highway Department acquired the necessary laboratory equipment to determine R-values. (Ref. 11)

In later work Erwin (Ref. 12) developed a mathematical relationship for soil support values and the common soil test results used in highway design and construction; i.e. void ratio, coefficient of uniformity, plasticity index, and gradation analysis. The above mentioned parameters were combined in models to predict an intermediate index value (soil characteristic number - SCN) for gravel, sand, silt, and clay. The SCN was highly correlated with the R-value test results. This correlation led to an implied relationship between soil support values and these soil tests.

The following equations were the results of multiple regression analyses for the different soil groups:

Gravel

$$SCN = 0.527 - 10.970\ VR + 38.611/C_u + 0.049\ G_1 - 0.064\ G_2 - 0.130\ G_3 + 0.006\ G_4 - 0.034\ G_5 + 0.155\ G_6 + 0.432\ PI$$

Sand

$$SCN = 0.231 + 2.007\ VR + 11.048/C_u - 0.050\ G_1 + 0.169\ G_2 - 0.130\ G_3 + 0.006\ G_4 - 0.034\ G_5 + 0.155\ G_6 + 0.432\ PI$$

Silt

$$SCN = -52.022 + 3.475\ VR - 23.304/C_u + 0.035\ G_1 + 0.921\ G_2 - 0.158\ G_3 - 0.313\ G_4 + 0.098\ G_5 + 0.155\ G_6 + 0.432\ PI$$

Clay

$$SCN = -3.956 + 1.532\ VR + 11.658/C_u + 0.706\ G_1 - 0.898\ G_2 + 0.378\ G_3 - 0.187\ G_4 + 0.082\ G_5 + 0.056\ G_6 + 0.036\ PI$$

Where

VR - void ratio

C_u - coefficient of uniformity

G_1 - percent passing the 3/4 inch sieve

G_2 - percent passing the 3/8 inch sieve

G_3 - percent passing the number 4 sieve

G_4 - percent passing the number 10 sieve

G_5 - percent passing the number 40 sieve

G_6 - percent passing the number 200 sieve

PI - plasticity index.

The R-value (at an exudation pressure of 240 psi) was predicted by using a fourth degree polynomial

$$R_{240} = 82.948 + 0.031(SCN) - 2.177(SCN)^2 + 0.200(SCN)^3 - 0.005(SCN)^4$$

A correlation coefficient of 0.95 resulted from comparing this equation and the measured R-values. The use of R-values determined at an exudation pressure of 300 psi did not yield a better correlation.

A subsequent analysis of the statistical residuals indicated that the measured R-value of silt soils was higher than the predicted test results. Laboratory investigation revealed that the suggested method of producing saturation was not sufficient for these soils. An alternate procedure of total immersion of the soil sample while remaining in the expansion pressure device was proposed. Results from these tests reduced the residuals and indicated a closer compliance with the desired physical conditions required by the R-value test procedure.

The use of Erwin's results could be beneficial to organizations that do not have the means to determine soil support values from the established methods reported by Langsner (Ref. 7). Since a loss in predicting accuracy is inherent, the implementation of the results was not recommended to the Arkansas Highway Department to replace their R-value testing program. Perhaps the most significant finding from Erwin's work was the proposed modification in the R-value test procedure for silt soils.

Phase II

Coefficient values have been established (by AASHO Road Test) and published for three materials, high stability plant mix surface course, crushed stone base course and a sandy gravel subbase. Samples of these materials were requested from the Illinois Highway Department to allow a laboratory investigation of the materials and determination of R-values. Unfortunately, only two materials with established coefficients were available, the crushed stone and the sandy gravel. A sample of the silty clay embankment material was included for possible use.

To evaluate the applicability of the Road Test results to Arkansas conditions, sources of Arkansas materials were selected from various quarries, borrow pits, plants producing materials, and roadways under construction. A total of 164 samples were collected from 14 different sources. Gradation analysis, Atterberg limits and R-value laboratory tests were performed on the collected samples (refer to Ref. 13 for test results). Replicate R-value tests were used to increase the statistical accuracy of the results.

The narrow range of R-values exhibited by the AASHO materials (72 to 81) precluded the establishment of any significant relationships between R-value and material coefficients. Supplementary data points were provided to increase the range of values by using the estimated coefficients of Arkansas materials (Ref. 14). However, use of the results from such an analysis could be nothing better than highly speculative.

The following information was the result of statistical analyses of certain Arkansas soil groups (Ref. 15):

Sands - $R_{240} = 70.571 \pm 2.114$

Standard deviation = 1.013

Crushed Stone - $R_{240} = 82.104 \pm 0.682$

Standard deviation = 0.341

Bank Gravel - $R_{240} = 78.530 \pm 1.303$

Standard deviation = 0.652

A confidence interval of 95 percent was used to calculate the expected range of values. It was concluded that there was no significant change for the R-values of materials in these groups.

An attempt to define the upper range of the R-value test results (possible range 0 to 100) by use of the coefficients for stabilized materials was implemented. It soon became apparent that the R-value test could not measure lateral resistance for values greater than that of crushed stone (R-value $\doteq$ 80). However, it did appear logical to define the lowest R-value (0) equivalent to a zero material coefficient. Thus, using this assumption and the two R-values from the AASHO materials a parabolic curve was established and recommended for use (Ref. 16). Further refinement was not possible until the collection of performance results were analyzed.

All of the work relating to Phase II was dependent on the assumption that the coefficients of relative strength were constants and could be related to the thickness index (structural number, SN) by the equation

$$SN = a_1D_1 + a_2D_2 + a_3D_3$$

The most widely publicized form of this equation is

$$SN = 0.44\ D_1 + 0.14\ D_2 + 0.11\ D_3$$

The numerical values assigned by AASHO Road Test as the material coefficients were weighted averages of all values obtained from different roadway designs and varying traffic loads. The ranges of the coefficients were:

	upper	lower	weighted average
a_1	.83	.33	.44
a_2	.25	.11	.14
a_3	.11	.09	.11

TABLE I

RANGE OF VALUES (Ref. 17)

Other suggested values for material coefficients (Table II) were rationalized from performance of wedge sections and based on engineering judgement (Ref. 3). The suggested thickness equivalences were related to one inch of asphaltic concrete without regard to location within the pavement structure.

Material	Suggested Coefficient	Thickness Equivalence
Asphaltic Concrete Surface	0.44	1.0 in.
Asphaltic Concrete Base	0.34	1.3 in.
Cement Treated Base, 650 psi	0.23	1.9 in.
Crushed Stone Base	0.14	3.1 in.
Sandy Gravel Subbase	0.11	4.0 in.
Sandy Gravel Base	0.07	6.3 in.

TABLE II

AASHO MATERIAL COEFFICIENTS AND THICKNESS EQUIVALENCES (Ref. 3)

The implication that a two (2) inch increase in surface course would decrease the required crushed stone base course by 6.2 inches is not always true (Ref. 17). The "constants" determined were based on measured performance relationships. If consideration had been given to other modes of behavior, such as deflection, different "constants" would have resulted.

On the basis of the above discussion it would appear useful to include other parameters in the design equation. The elastic deformation characteristics of pavement components are suggested as relative quantities to be considered.

Phase III

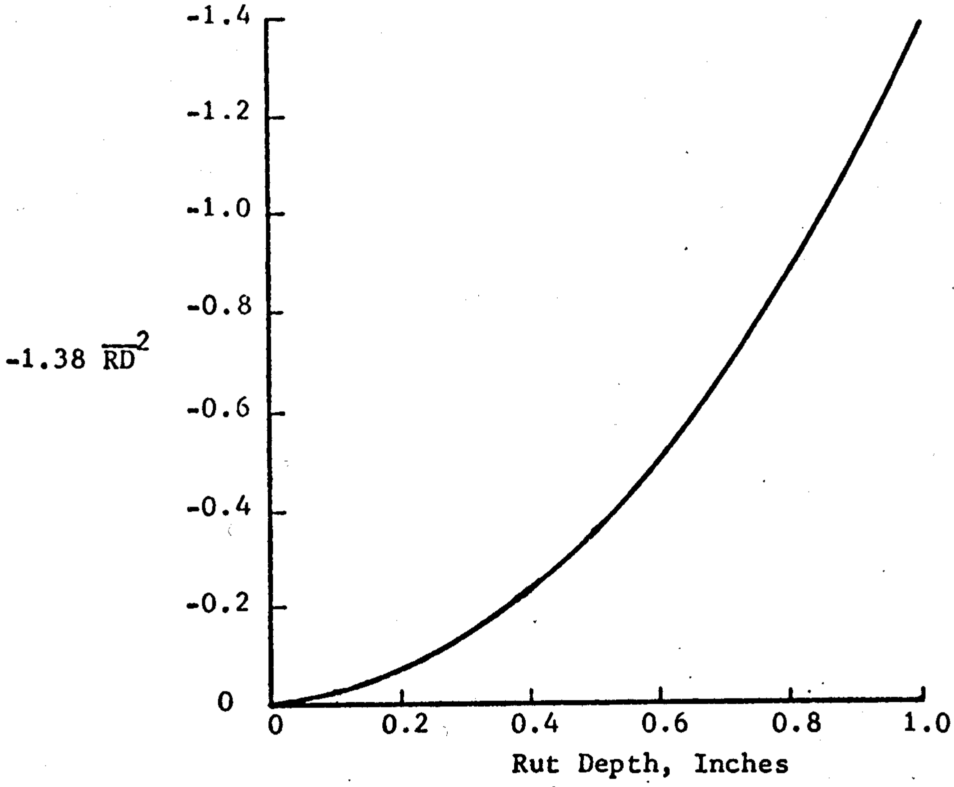
Prior to the AASHO Road Test, pavement performance was a qualitative measurement that varied with the origin (source) of the mentioned quantity. Highway designers evaluated pavements in a different view than highway users. It was required for the success of the Road Test to be able to quantitatively rate the performance of the pavement structure. The pavement serviceability-performance concept was designed to meet this need.

From the wide selection of people associated with highways (designers to users) a panel was chosen to subjectively rate a series of highway sections in three states (Ref. 9). The panel members were instructed to individually rate each section on a 0.0 to 5.0 scale. A value of five (5) indicated the best possible rating and a value of zero (0) was indicative of a very poor pavement serviceability. Replicate ratings and a random order of reviewing times were used to eliminate bias of the rating panel.

At the time of the panel evaluation of a highway section, measurements were made of the physical quantities of longitudinal and horizontal profiles, and the area of cracking and patching were recorded. These individual values were related to the mean value of serviceability as determined by the panel groups. Using transformations to linearize the regression coefficients, a predicting equation was established to quantitatively describe the ability of a pavement to serve the users (refer to p 9 Chap III). The use of this equation in the analysis of the Road Test data was necessary to derive the published results.

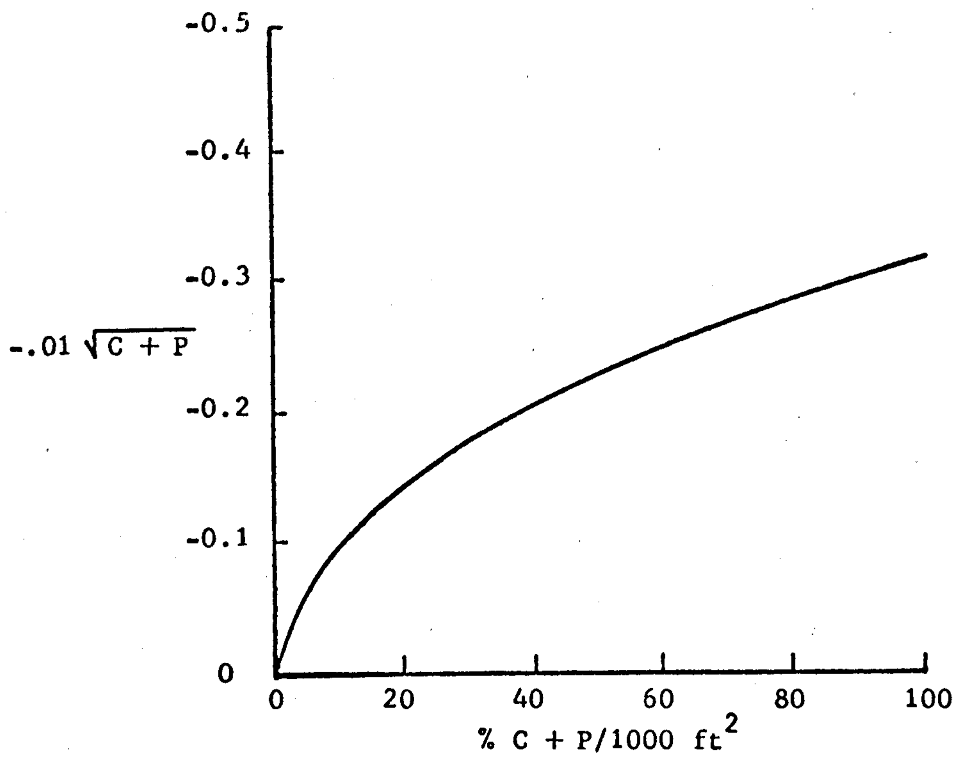
An analysis of the procedure used to produce the PSI equation causes the reader to question the accuracy of the final form. The scattergrams presented for rut depth and cracking and patching indicate a large variance for the regression coefficients of these parameters. Although the contributions to the PSI (or from the PSI) are small, they are not negligible quantities (Figures 1 and 2). The proposed rating scale from 0 to 5 produced a range of mean values from 0.9 to 4.4 by the panel. The independent variable for the regression analysis was the mean serviceability ratings by the panel but these values had a standard deviation of 0.46. Thus, the independent variable was not established as an "exact value". The statistical residuals between the PSR (Present Serviceability Rating - by panel) and the PSI were 0.30 for an average value and the correlation coefficient indicates that 84% of the total variation was explained by the PSI equation.

When considering a typical pavement designed for failure at p = 2.5 with a constructed initial value of 4.2, and a 10 year design, it appears reasonable that yearly measurements of PSI would not yield definite trends. Figure 18 of Ref. 9 indicates that the pavement sections at the Road Test did not deteriorate gradually, but exhibited a sudden loss of serviceability. Also, it should be mentioned that these plotted points are the results of smoothing techniques which tend to mask the varying nature of the original data (Ref. 4).



Rut Depth Effect

Figure 1



Cracking and Patching Effect

Figure 2

The CHLOE profilometer used for Phase III of HRP-20 was a model developed after the AASHO profilometer. Many problems were encountered with the operation of the mechanical and electrical components. Consequently, only three (3) sets of serviceability measurements were made on Arkansas test sections. The original work plan scheduled semi-yearly serviceability measurements. Since it was necessary for University personnel to operate the profilometer, only yearly measurements were possible. The three yearly measurements define the serviceability trend for two time increments of one year.

The results of the serviceability determinations were not indicative of any definite trends (refer to Appendix A). Many test sections exhibited a gain in serviceability rating for the three measurements. However, the gains or losses of serviceability ratings were of such small magnitude that they are not statistically significant. Since replicate testing was performed, it was assumed that the variation was not from the operation of the measuring equipment but from the quantities being measured. The CHLOE profilometer was correlated with the AASHO profilometer, which had been previously correlated with the rating panel. Thus, the failure of the CHLOE profilometer to be able to record small changes of pavement serviceability is inherent to the developed procedures. In view of the many sources of variation of the performance serviceability concept, the performance measurements were disregarded.

CHAPTER V

MATHEMATICAL DEFLECTION MODELS

A highway pavement structure is designed to provide a smooth riding surface for vehicular traffic. Each vehicle induces a stress within the pavement components due to the strain (deformation) caused by the magnitude of load, axle arrangement, tire size and pressure. The stress distribution for the pavement materials is dependent on the physical properties of the components and their interaction within the structure. Attempts to rigorously define the pavement response and relationships have met with a very limited success because of the assumptions required to apply theoretical analyses.

Even though the exact characteristics remain unknown, inferences of stress conditions are provided by the strain curve. The more acute the rate of change of the strain curve the higher the stresses developed within a pavement structure. In recent publications from Texas A and M University (Ref. 18) the stiffness of a material is defined as the ability to resist sharp curvature. Thus, materials that posses high stiffness values are desirable as pavement components.*

Determination of the stiffness coefficients evolved from the development of a mathematical model used to predict pavement deflection. For a complete explanation of the model derivation refer to Ref. 19. The deflection of a pavement can be described by

$$W_j = \sum_{k=1}^{n+1} \Delta_{jk}$$

*Actually, the ideal material is one that will not permanently deform or crack as a result of the movements, both load and environment associated, that it must undergo within a given period of time.

where

$$\Delta_{jk} = \frac{C_0}{a_k^{C_1}} \left[\frac{1}{\left(r_j^2 + C_2\left(\sum_{i=0}^{k-1} a_i D_i\right)\right)^2} - \frac{1}{\left(r_j^2 + C_2\left(\sum_{i=0}^{k} a_i D_i\right)\right)^2} \right]$$

$a_0 = D_0 = 0$

n - number of layers of the pavement (exclusive of the subgrade)

C_0, C_1, C_2 are constants

r_j - the distances (inches) from the point of application of either Dynaflect load to the j^{th} sensor (see Fig. 3)

a_i - material stiffness coefficient of the i^{th} layer

D_i - thickness of the i^{th} layer

Deflection data from a factorially designed test track provided the means by which constants were determined and the deflection model tested for predicting accuracy.

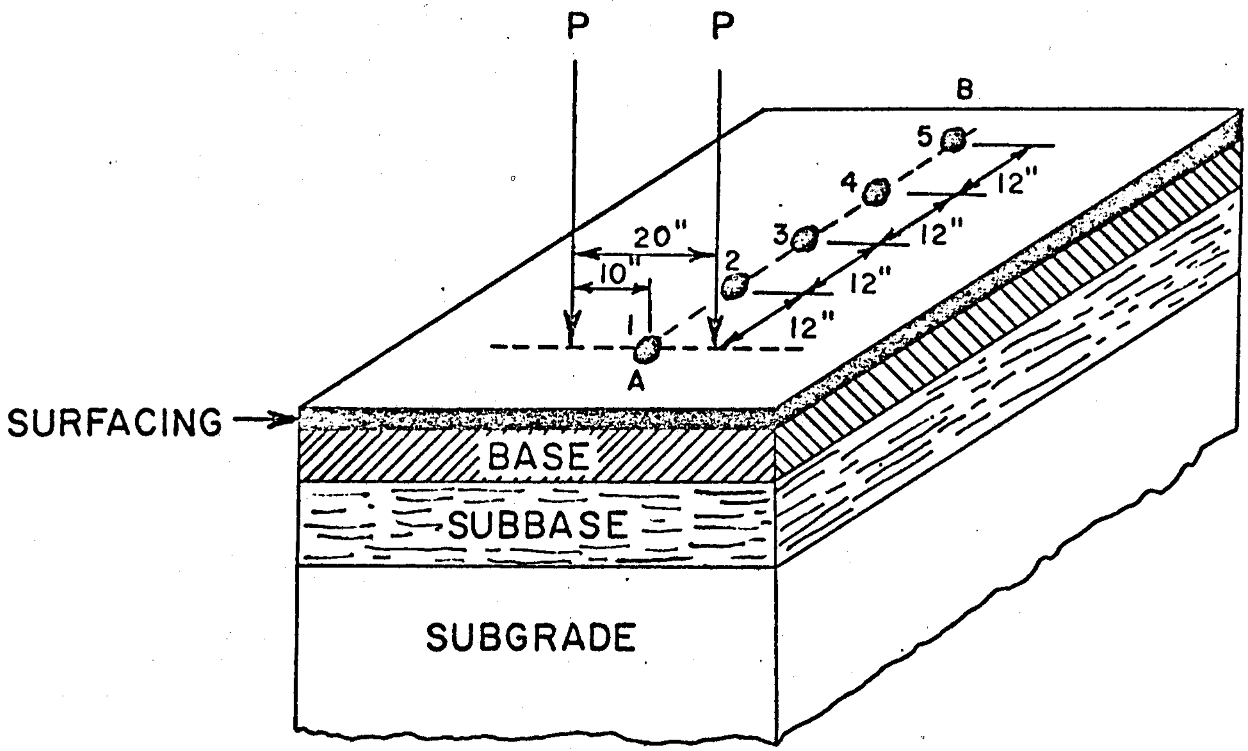
By using previously established correlations (Ref. 20) between the Dynaflect and the Benkelman beam, and data sets from the AASHO Road Test, the deflection model was modified for use with deflections measured by the Benkelman beam. The change was indicated by

$$B_0 = C_0 \ \frac{20\ L}{18}$$

L - Axle load in kips

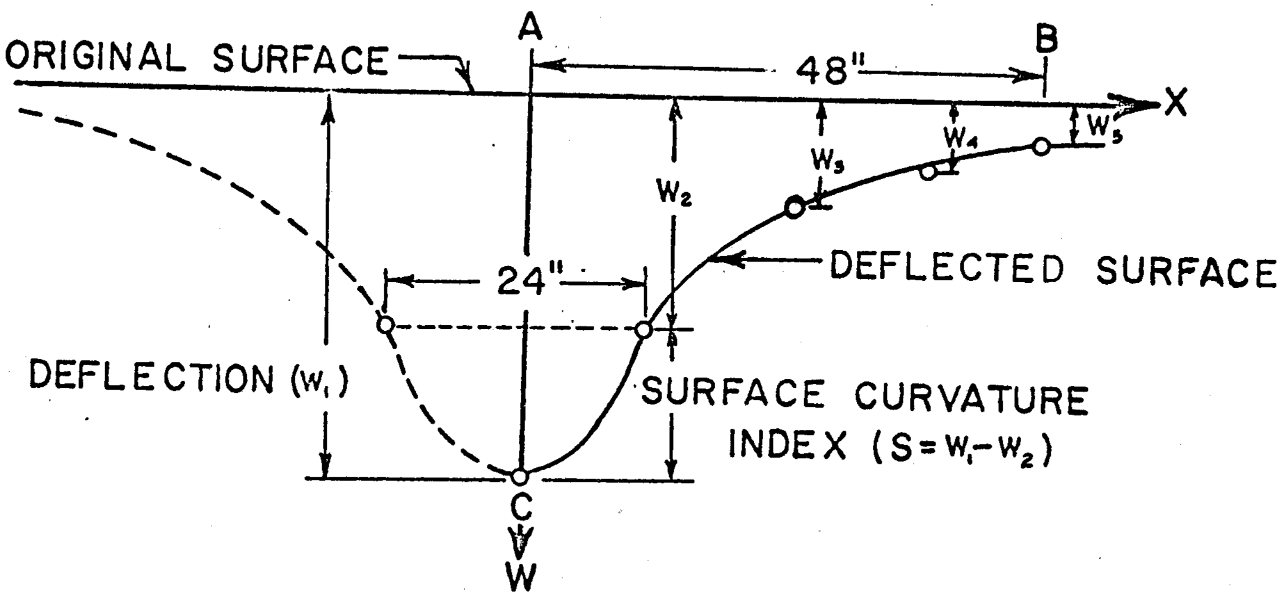
Substitution of B_0 for C_0 into the equation yielded a useful form.

Figure 4 represents an idealized deflection curve as indicated from Dynaflect measurements and Fig. 3 illustrates the location of the Dynaflect sensors on the pavement surface. Scrivner and Moore define the surface curvature index (SCI) as the difference between deflections W_1 and W_2.



Location of Dynaflect sensors (1 to 5) and load (from Ref. 18)

Figure 3



Deflection curve from Dynaflect readings (from Ref. 18)

Figure 4

Minimization of the SCI, whether by increasing thicknesses and/or using additional materials, is the desired end product.

Utilization of the pavement design concept as outlined in the previous paragraph requires a minimum of two deflection measurements of the same strain curve. After attempting many models, the following equation was chosen as a reasonable representation of the deflection curve (as measured by the Benkelman beam).

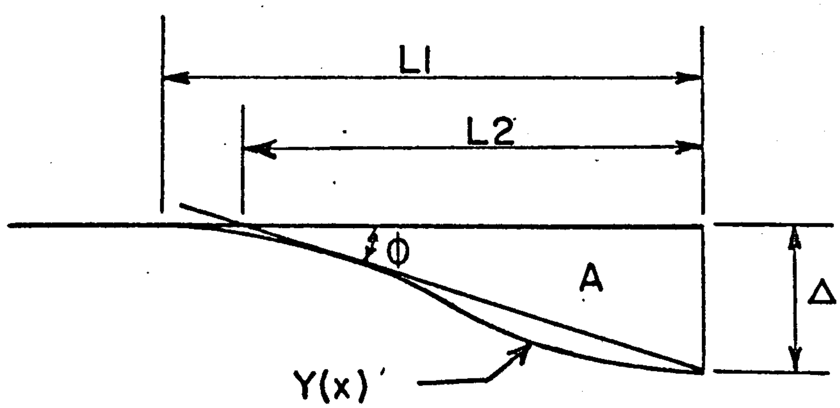
$$y = \Delta e^{-kx^n}$$

Δ - maximum measured deflection

k,n - constants to be determined for each curve

$e = 2.718$

The decaying exponential curve has a value of $Y = \Delta$ at $X = 0$, and $Y = 0$ at $X = \infty$. Also, these boundary conditions exist: if n is greater than 1, then a point of inflection does occur; and $dy/dx = 0$ at $X = 0$. Incorporation of these facts and comparison of measured curves and predicted curves provided the basis for model selection.



Deflection Curve Parameters

Figure 5

Determination of the constants k and n involved the use of the measured parameters L2 and Area (A) as described in Ref. 21. Area (A) is the planar measurement of the area bounded by one-half the deflection curve and L2 is the surface distance of a line from the maximum deflection tangent to the deflection curve (Fig. 5). A computer program was written to produce tables containing values of A and L2 for varying values of k and n for the equation $y/\Delta = e^{-kx^n}$. The value of Δ is a linear scaling factor applied in the Y direction and is related to the area by

$$A = \int_0^L \Delta\, y\,dx = \Delta \int_0^L y\,dx$$

or

$$A/\Delta = \int_0^L y\,dx$$

From Fig. 5 it is evident that

$$\tan \emptyset = \frac{\Delta\, e^{-kx^n}}{L2}$$

Since $\tan \emptyset$ is the first derivative (dy/dx) evaluated at X, and $Y(0) = \Delta$ then

$$L_2 = \frac{\Delta}{y'(X)} = \frac{1}{-kx^{n-1}\; e^{-kx^n}}$$

Thus, Δ does not influence the value of L2. Application of this information is a simple process of dividing the mean area from the deflection measurements by the mean Δ and matching the quotient and the mean L2 with a corresponding set of table values for k and n.

The degree of curvature (K) is related to a continuous function by the equation

$$K = \frac{d^2y/dx^2}{[1 + (dy/dx)^2]^{3/2}}$$

An evaluation of the curves fitted to the Benkelman beam data revealed that the average distance from the load at which the minimum radius of curvature (a high degree of curvature) occurred was located at X = 0.5 ft.

Upon determination of a predicting curve, it was possible to evaluate the deflection at any distance from the load. As previously mentioned

$$SCI = W_1 - W_2$$

where

$$W_j = f(a_i D_i)$$

In theory it would be possible to determine the material stiffness coefficients for a multi-layered system, but at the present time the research findings from Texas A and M University indicate that W_j should be evaluated only at j = 1 and 2. Thus, only the deflections from a two layer pavement could be solved for the material coefficients according to equations

$$\text{(Eq. 2)} \quad W_1 = \frac{B_0}{a_1^{C_1}}\left[\frac{1}{r_1^2} - \frac{1}{r_1^2 + C_2(a_1D_1)^2}\right] + \frac{B_0}{a_2^{C_1}}\left[\frac{1}{r_1^2 + C_2(a_1D_1)^2}\right]$$

$$\text{(Eq. 3)} \quad W_2 = \frac{B_0}{a_1^{C_1}}\left[\frac{1}{r_2^2} - \frac{1}{r_2^2 + C_2(a_1D_1)^2}\right] + \frac{B_0}{a_2^{C_1}}\left[\frac{1}{r_2^2 + C_2(a_1D_1)^2}\right]$$

Combining the above equations to eliminate a_2 yields

$$\frac{W_1 - \frac{B_0}{a_1^{C_1}}\left[\frac{1}{r_1^2} - \frac{1}{r_1^2 + C_2(a_1D_1)^2}\right]}{W_2 - \frac{B_0}{a_1^{C_1}}\left[\frac{1}{r_2^2} - \frac{1}{r_2^2 + C_2(a_1D_1)^2}\right]} - \frac{r_2^2 + C_2(a_1D_1)^2}{r_1^2 + C_2(a_1D_1)^2} = 0 \quad \text{(Eq. 4)}$$

Solution for a_1 by an iteration technique and back substitution into equations 2 or 3 allows determination of a_2. Utilization of this procedure is discussed in the next chapter.

CHAPTER VI

ANALYSIS OF DEFLECTION DATA

Computer programs were developed to evaluate equation 4 and subsequently determine a_1 and a_2. W_1 was defined as the maximum measured deflection and W_2 was the deflection model evaluated at $X = 1$ ft. Preliminary analysis was restricted to test sections of two layers ($n = 1$); i.e. a thin asphaltic seal coat, base material and a foundation material. It was assumed that the seal coat did not contribute to the stiffness of the pavement structure.

Additional test sections were analysed by combining the thicknesses of intermediate layers with either the base or foundation material. These combinations were made after careful consideration of the materials involved, their locations within the pavement structure, and the individual layer thicknesses. Table III presents the results of this analysis, with bracketed values being the combined quantities. The coefficient value for asphaltic concrete hot-mix was assumed to be the same as the value reported by Texas A and M University.

Appendix B contains the boring logs of the 27 test sections for which three years data had been collected. Comparison of this data and Table III reveals that 15 sections were deleted from the analysis for stiffness coefficients. Exclusion of these sections was based on the total number of layers, the lack of uniform representation throughout the test section, and/or the failure of the mathematical model to adequately describe the deflection (4 sections).

TABLE III

SUMMARY OF PAVEMENT COMPONENT DATA

Layer Description	Mean Layer Thickness (ft)	Stiffness Coefficient 1967	1968	1969	PI	-200 sieve	SCI (mils)
			SECTION 1-7-1				
Double Seal	0.06	0.0	0.0	0.0	-	-	1967 - 4.63
Gravel Base	0.92	0.421	0.402	0.429	NP	8.3	1968 - 6.12
Subgrade	∞	0.470	0.414	0.561	9.6	86	1969 - 3.88
			SECTION 64-17-1				
Asphaltic Concrete	0.29	0.522	0.522	0.522	-	-	1967 - 3.53
Gravel Base	0.82	0.452	0.398	0.421	NP	6.3	1968 - 5.29
Select Material	2.14						1969 - 4.00
Subgrade	∞	0.422	0.421	0.491	5.5	84	
			SECTION 8-14-2				
Double Seal	0.09	0.0	0.0	Not	-	-	1967 - 20.96
Gravel Base	0.53	0.237	0.215	Det*	NP	5.7	1968 - 25.08
Subgrade	∞	0.356	0.355		NP	85	

* Not Det - Not Determined

TABLE III (CONT'D)

Layer Description	Mean Layer Thickness (ft)	Stiffness Coefficient 1967	1968	1969	PI	-200 sieve	SCI (mils)
			SECTION 70-5-3				
Asphaltic Concrete	0.18	0.522	0.522		-	-	1967 - 6.08
Gravel Base	0.97	0.386	0.352	Not	NP	12.2	1968 - 8.19
Common Excavation	.60	0.500	0.688	Det			
Subgrade	∞				22.8	34.3	
			SECTION 71-5-3				
Asphaltic Concrete	0.33	0.522	0.522	0.522	-	-	1967 - 7.49
Gravel Base	0.86	0.344	0.326	0.373	NP	9.1	1968 - 9.92
Select Material	1.78	0.609	0.422	0.460	NP	14.5	1969 - 6.00
Subgrade	∞						
			SECTION 82-1-3				
Asphaltic Concrete	0.22	0.522	0.522	0.522	-	-	1967 - 12.88
Gravel Base	0.48	0.301	0.281	0.286	NP	15.9	1968 - 15.06
Select Material	0.60	0.376	0.382	0.390	NP	16.4	1969 - 14.03
Subgrade	∞						

TABLE III (CONT'D)

Layer Description	Mean Layer Thickness (ft)	Stiffness Coefficient 1967	1968	1969	PI	-200 sieve	SCI (mils)
		SECTION 4-13-7					
Asphaltic Concrete	0.39	0.522	0.522		-	-	1967 - 14.02
Double Seal	0.09	0.0	0.0	Not	-	-	1968 - 12.42
Gravel Base	0.52	0.270	0.278	Det	NP	20.7	
Subgrade	∞	0.406	0.428		11.8	66	
		SECTION 79-4-7					
Asphaltic Concrete	0.56	0.522	0.522	0.522	-	-	1967 - 1.83
Cold Mix	0.57	0.540	0.440	0.397	NP	12	1968 - 2.94
Gravel Base	0.21						1969 - 3.61
Subgrade	∞	0.555	0.439	0.482	NP	71	
		SECTION 132-1-7					
Double Seal	0.05	0.0	0.0	0.0	-	-	1967 - 16.46
Gravel Base	0.43	0.356	0.287	0.257	NP	13.7	1968 - 20.85
Subgrade	∞	0.310	0.323	0.351	NP	82	1969 - 21.42

TABLE III (CONT'D)

Layer Description	Mean Layer Thickness (ft)	Stiffness Coefficient 1967	1968	1969	PI	-200 sieve	SCI (mils)
		SECTION 118-2-10					
Double Seal	0.06	0.0	0.0	0.0	-	-	1967 - 13.53
Gravel Base	0.85	0.321	0.353	0.378	NP	7.6	1968 - 12.68
Old Gravel Base	0.26						1969 - 8.54
Subgrade	∞	0.427	0.327	0.373	49	63	
		SECTION 136-0-10					
Double Seal	0.05	0.0	0.0	0.0	-	-	1967 - 14.57
Gravel Base	0.91	0.327	0.346	0.318	NP	5.1	1968 - 13.46
Old Gravel Base	0.23						1969 - 14.31
Subgrade	∞	0.358	0.328	0.416	5.2	20.8	
		SECTION 312-1-10					
Double Seal	0.05	0.0	0.0	0.0	-	-	1967 - 25.03
Gravel Base	0.43	0.216	0.281	0.196	NP	5.1	1968 - 25.98
Subgrade	∞	0.327	0.297	0.360	NP	77	1969 - 23.21

Readers are cautioned not to confuse the material stiffness coefficients with the relative strength coefficients associated with the AASHO design procedure. The stiffness is a property of the in-situ material and it does not seem probable that laboratory tests can be used to predict the stiffness coefficient. The wide range of values for the gravel bases supports this statement.

Based on the relative association exhibited by the results of Table III the following procedure, as given in Ref. 20, can be adopted for determination of material stiffness coefficients in Arkansas.

1. From the construction records select an existing pavement that has a layered construction suitable for analysis as described in the above paragraphs.
2. Conduct a series of deflection tests.
3. Determine the layer thicknesses at each deflection test station.
4. From the results of the tests (2 and 3) determine the stiffness coefficients for the appropriate materials.

Evaluation of the different designs with respect to SCI will provide a basis for highway design considerations.

After a careful review of the data pertaining to each test site, the authors concluded that the material stiffness coefficients presented in Table III, are representative of the respective material's ability to resist curvature. The fact that the subgrade stiffnesses are greater than the base stiffnesses can be explained by the types of materials and drainage characteristics of the test sites; i.e. a confined silt or clay that is well drained will exhibit high resistance to deformation. Deflection measurements were determined during the summer months. Thus, it is probable that the moisture conditions of the components were minimal. Also, the noticeable surface deterioration of these sections was not typical of subgrade failure.

Thus, deflection measurements can be used to indicate the composite strength of a pavement structure. Evaluation of the structural components by determination of the stiffness coefficients provides a method of material comparison.

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APPENDIX A

The following pages present the serviceability measurements of 27 sections for the three years of observation. Ten (10) test sites were excluded from this analysis for the following reasons:

No. of Sites	Reason
5	section resurfaced
2	no boring data
1	profilometer malfunction
1	excessive deflections
1	base material placed on a rigid pavement

PSI was determind by using equation 1 and a modification for surface texture roughness (Ref. 22). The texture corrections was additive to the PSI and calculated from

$$TC = 0.84 \log (1 + T)$$

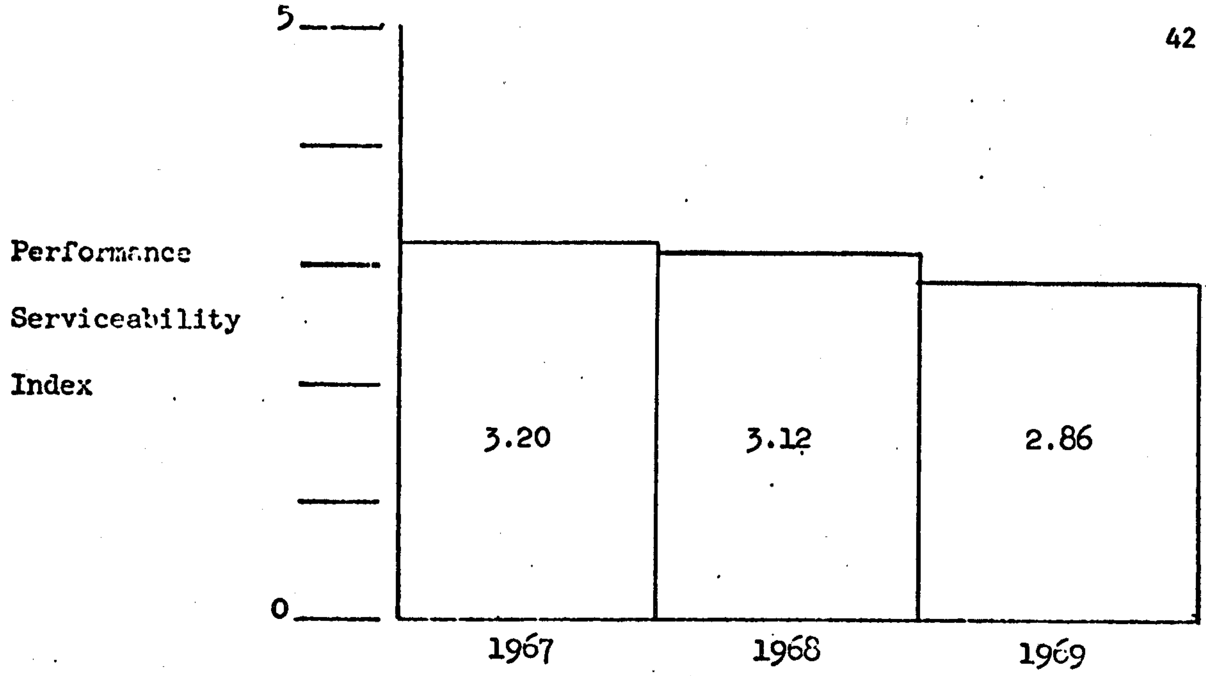
T - average texture meter reading

TC - texture correction

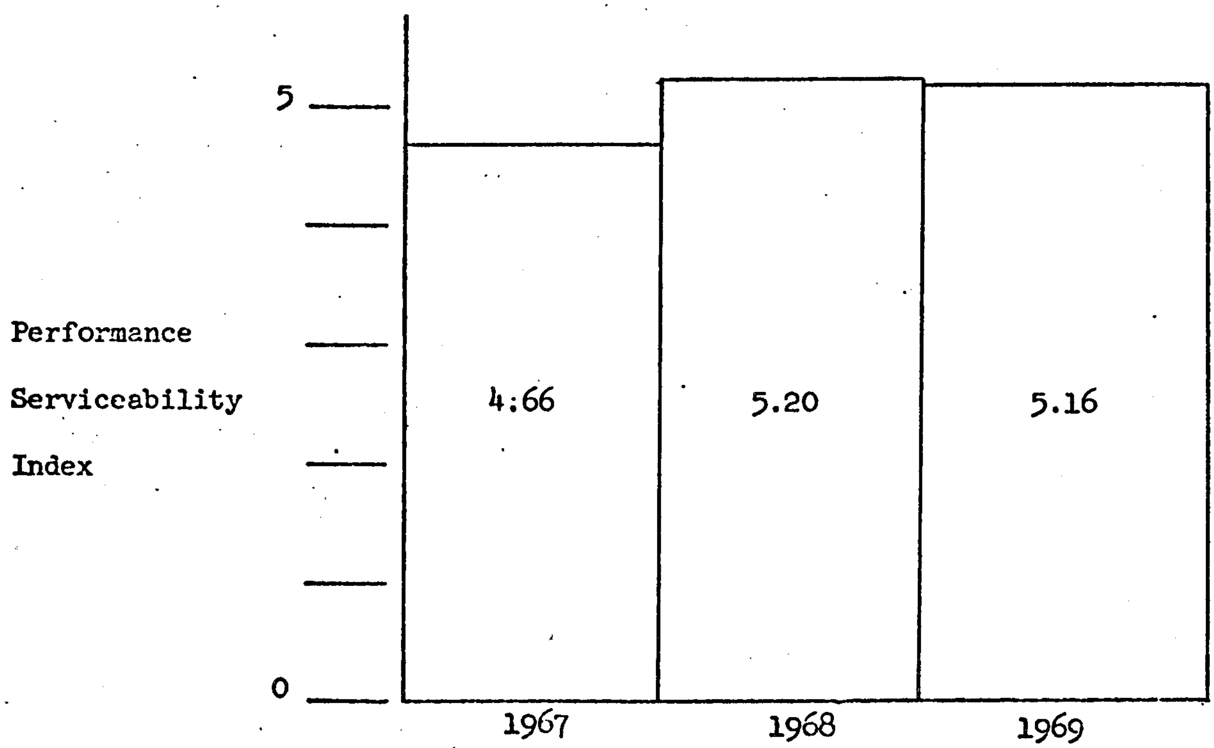
Test section identification is indicated below each histogram. The following format was used to identify the sites;

Highway - Section - District

Numbering for each component coincides with the identification used by the Arkansas Highway Department.


5
0
Performance
Serviceability
Index
3.20
3.12
2.86
1967
1968
1969

1-7-1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Serviceability
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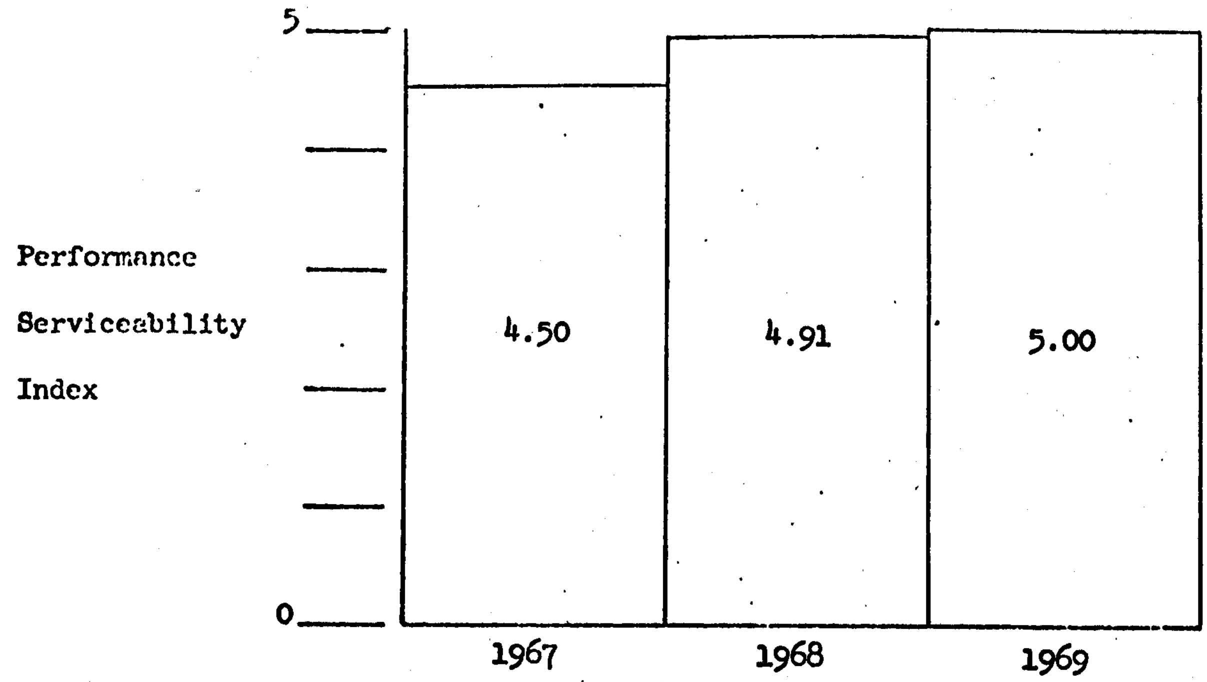
5.16
1967
1968
1969

49-1-1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Serviceability
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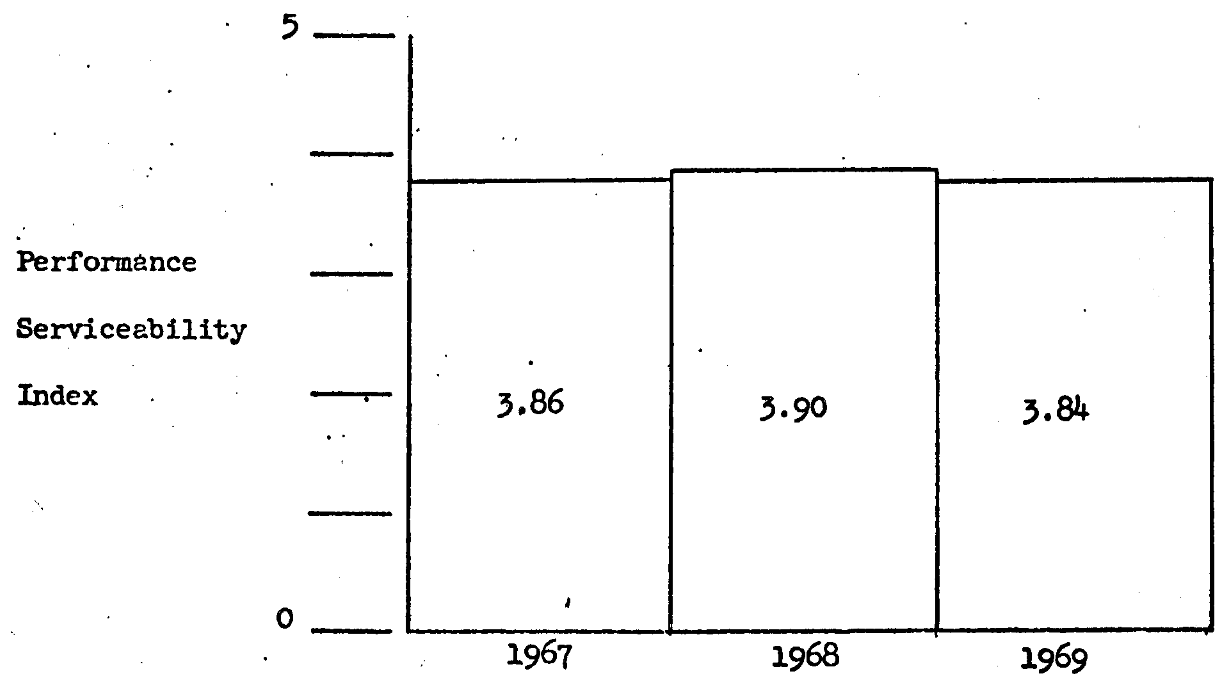
5.00
1967
1968
1969

64-17-1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Performance
Serviceability
Index
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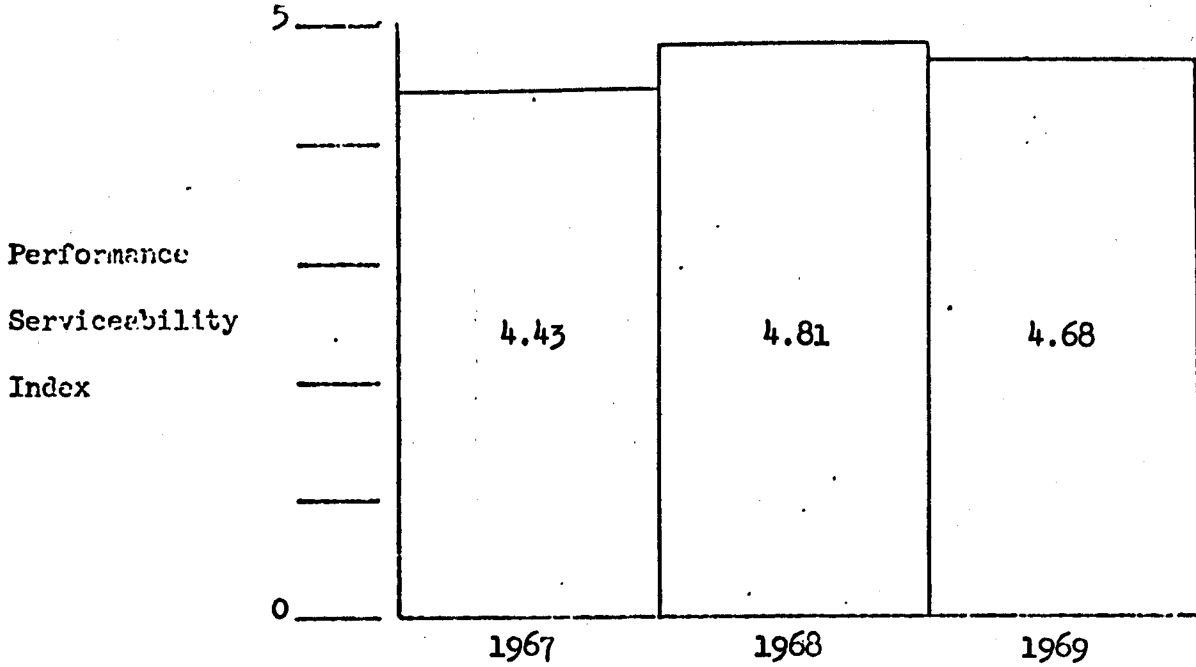
1967
1968
1969

8-14-2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Performance
Serviceability
Index
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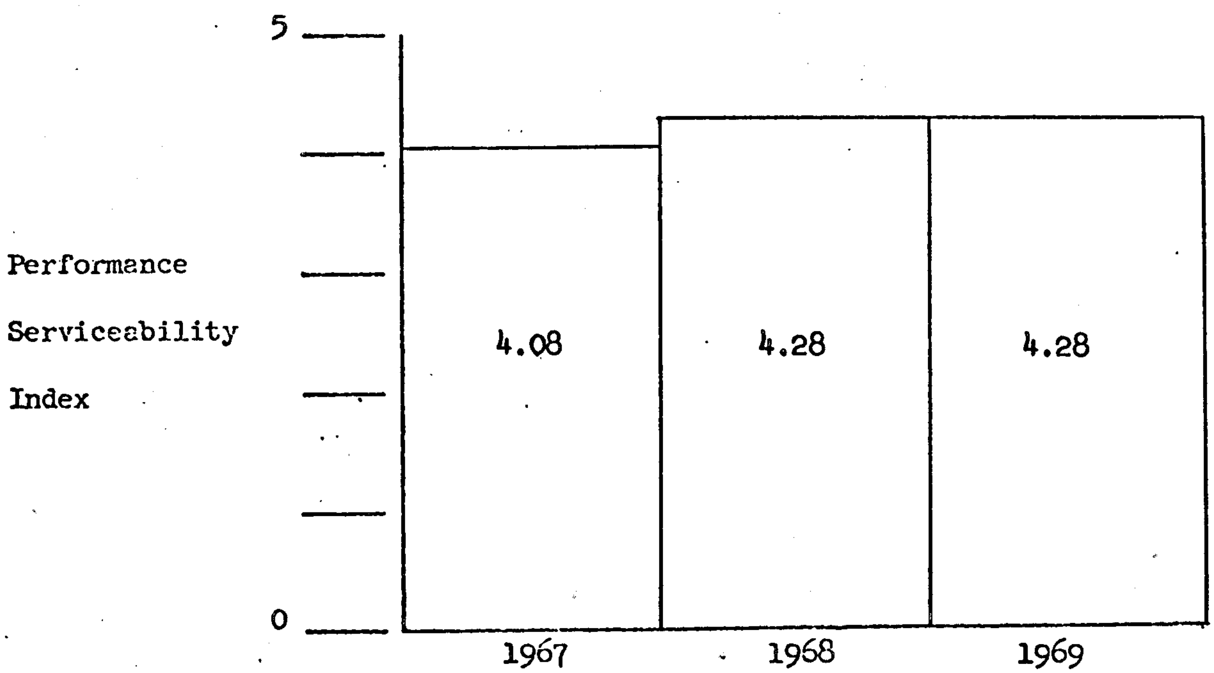
1968
1969

79-7-2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Performance
Serviceability
Index
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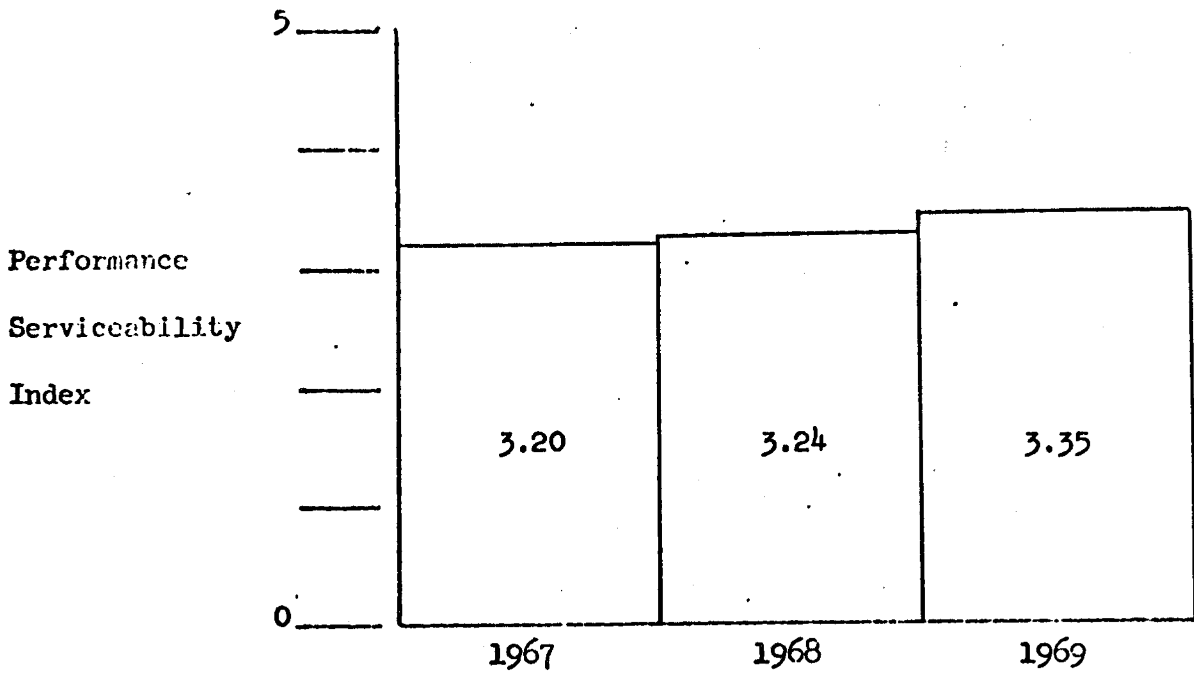
1968
1969

79-10-2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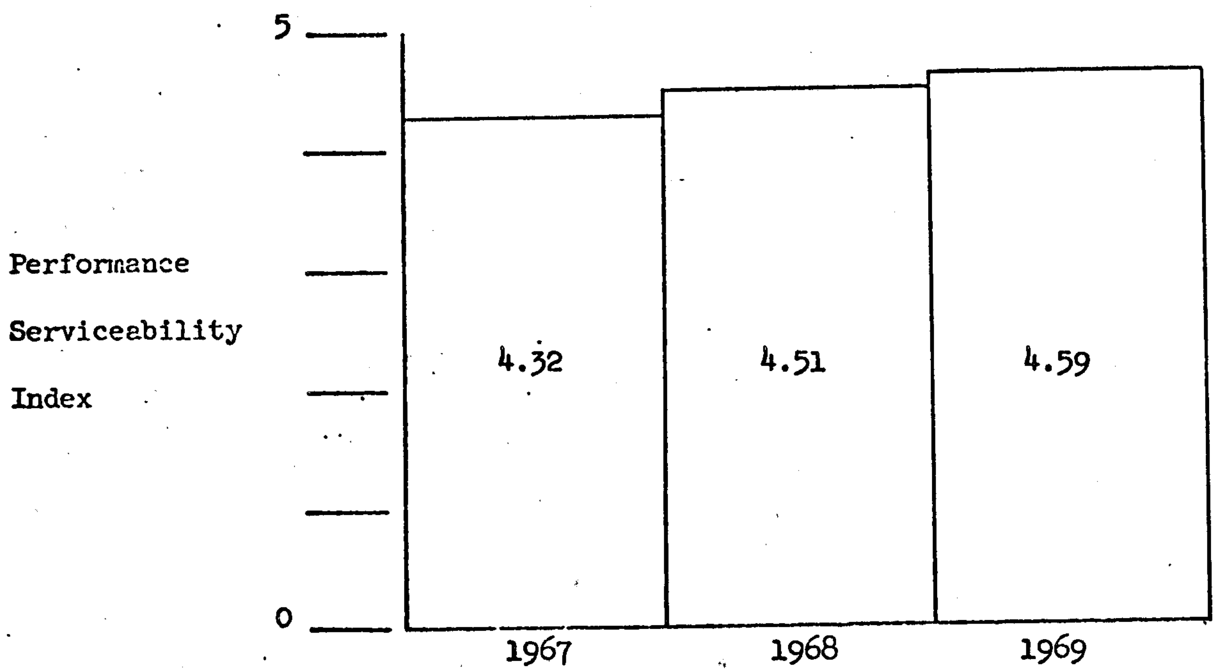
1968
1969

41-3-3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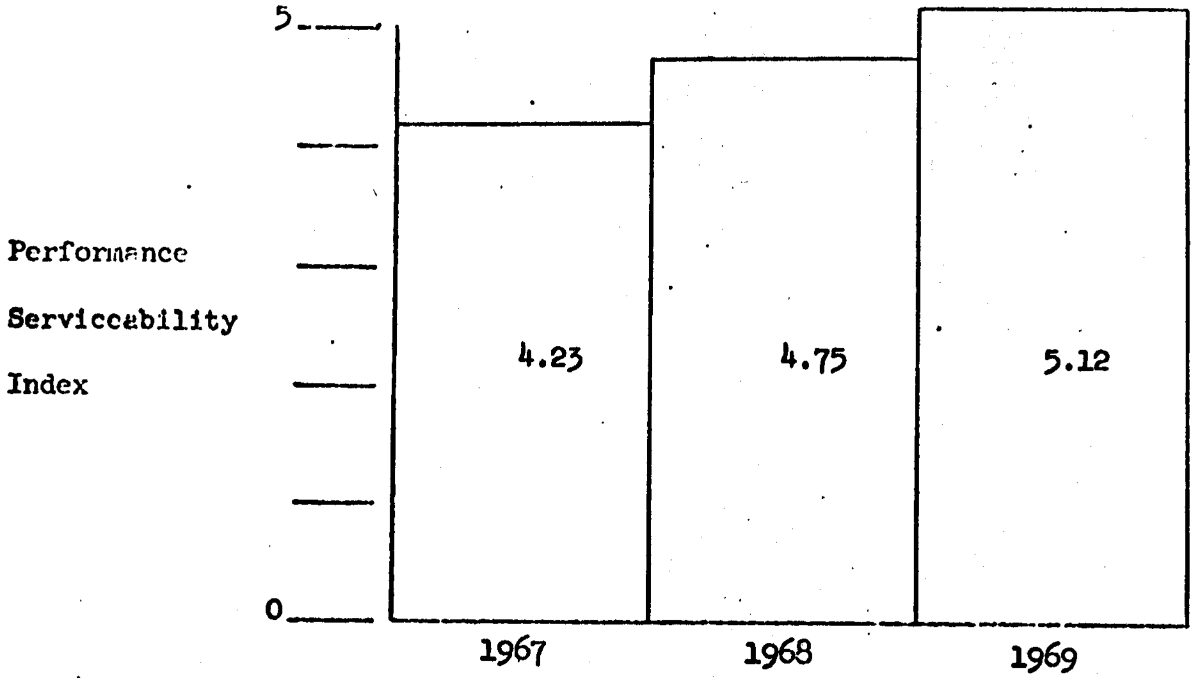
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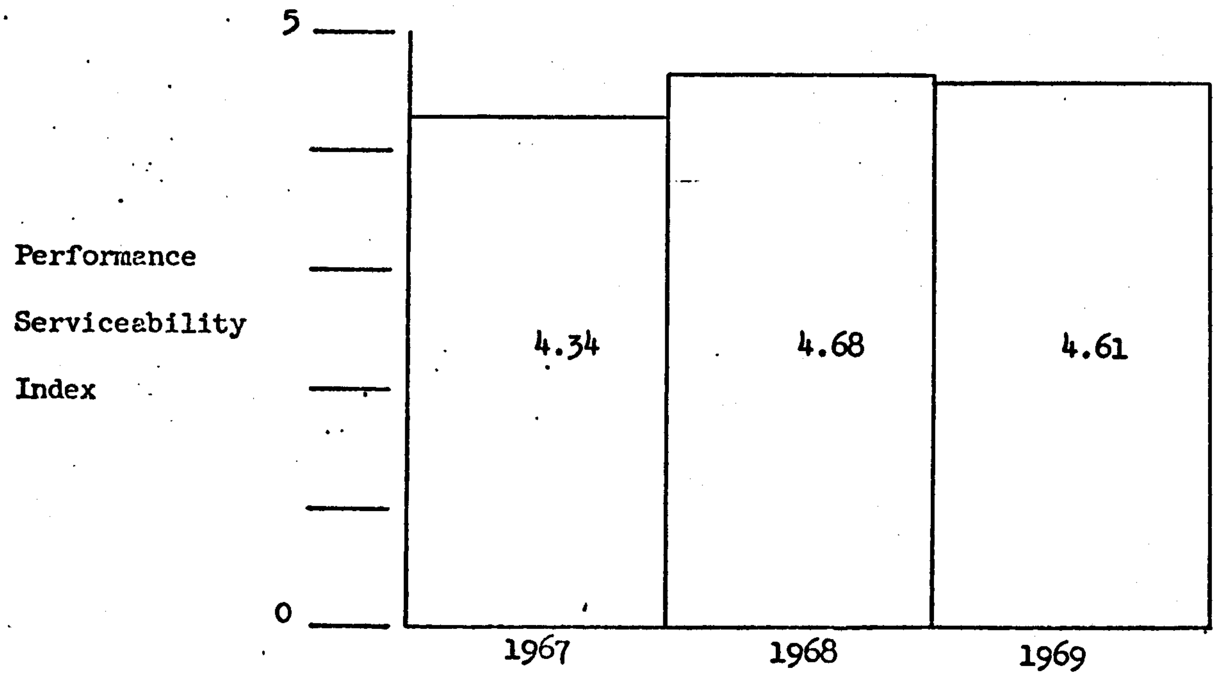
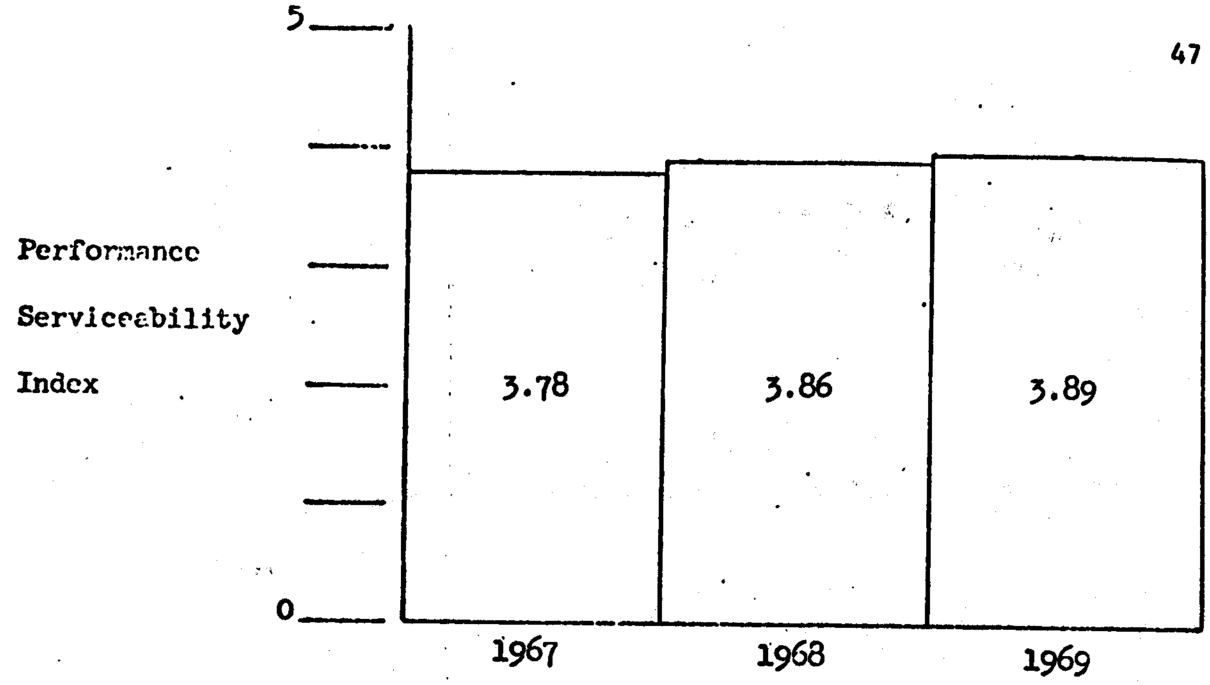
1968
1969

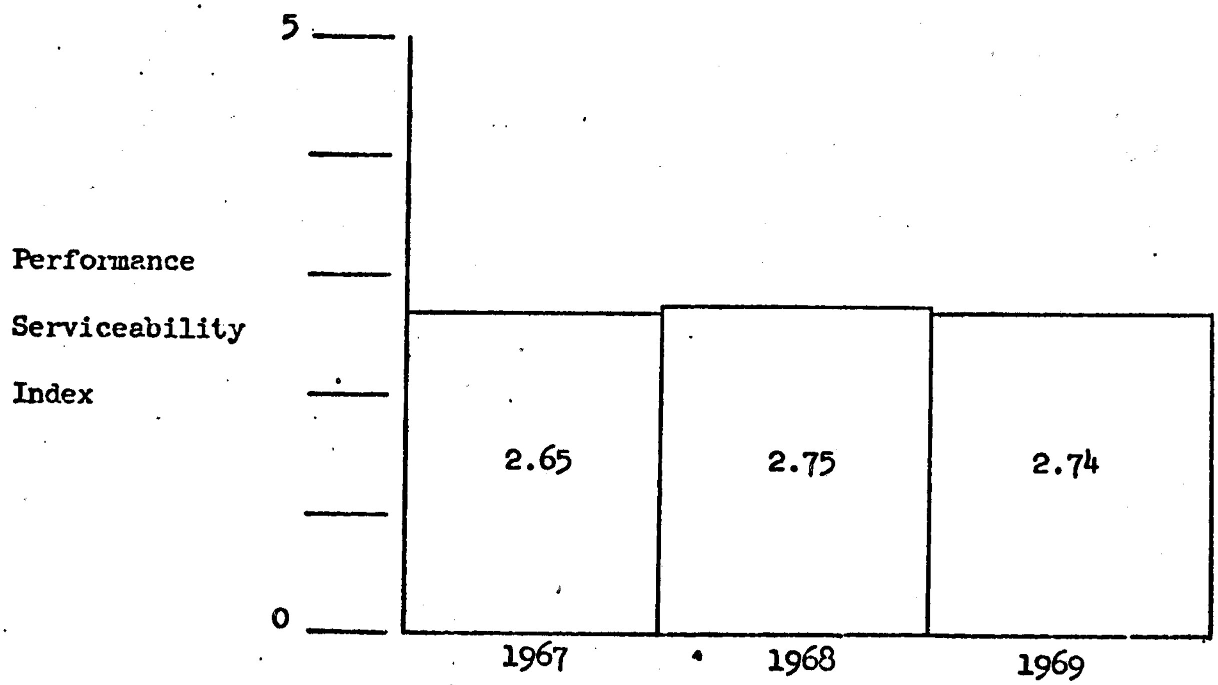
71-2-3


5
Performance
Serviceability
Index
0
4.34
4.68
4.61
1967
1968
1969

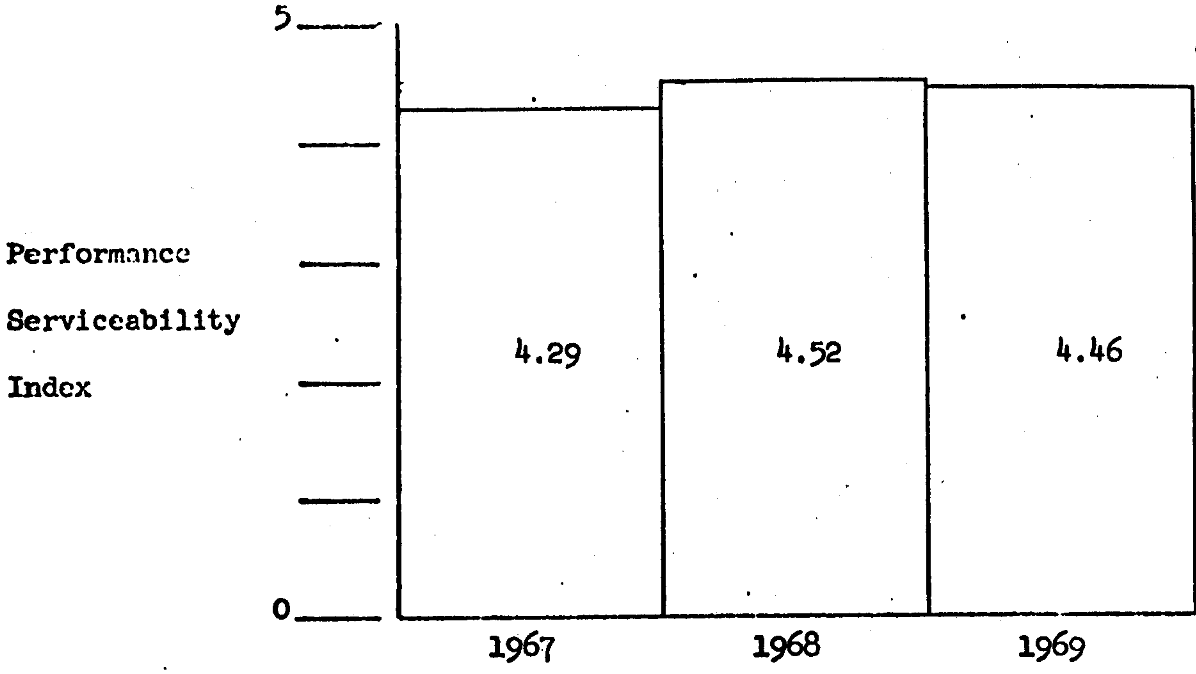
71-5-3


5
Performance
Serviceability
Index
0
3.78
3.86
3.89
1967
1968
1969

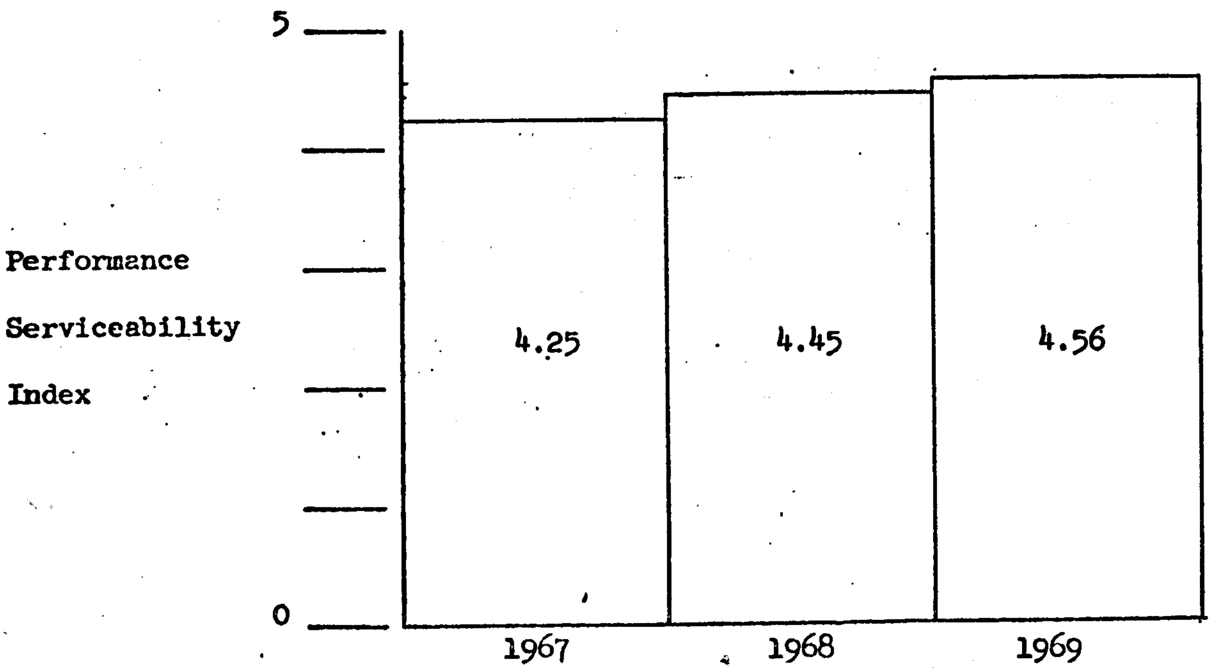
82-1-3


5
Performance
Serviceability
Index
0
2.65
2.75
2.74
1967
1968
1969

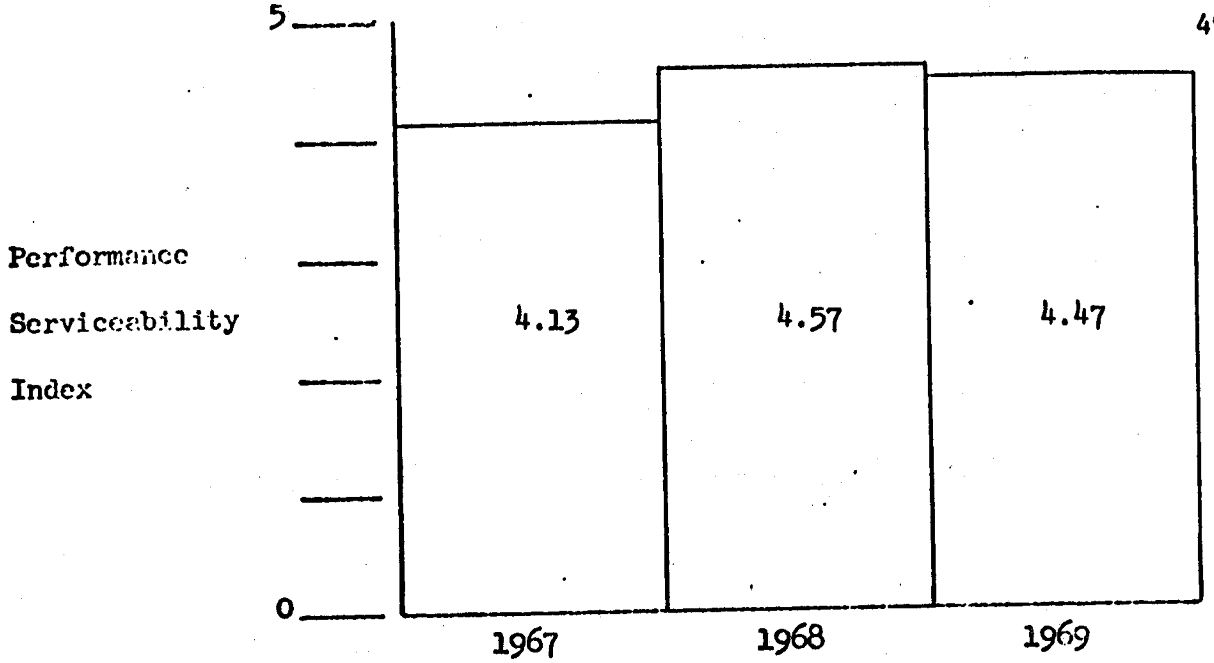
13-10-6



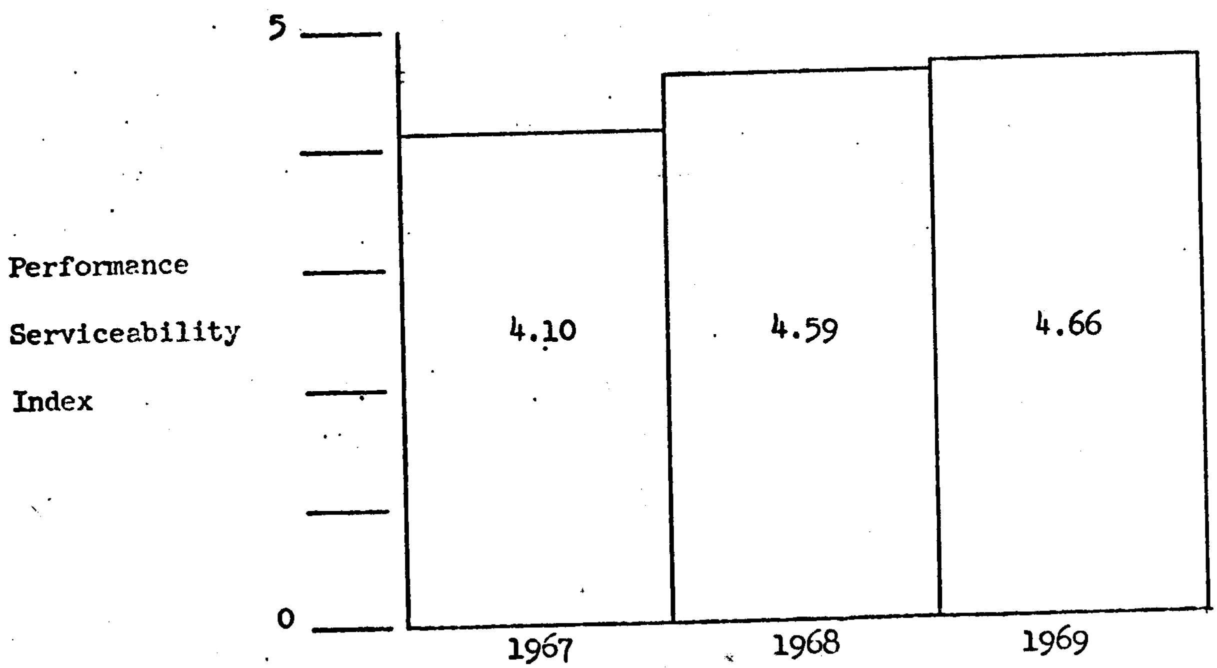
70-10-6



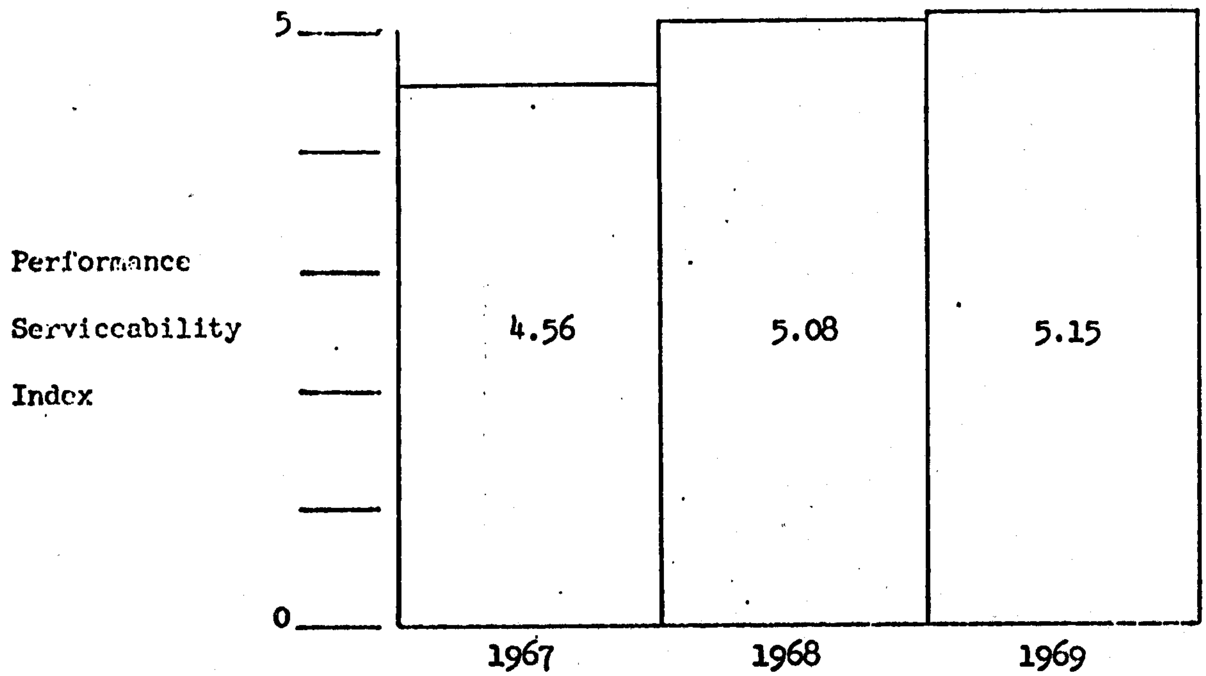
167-10-6


5
0
Performance
Serviceability
Index
4.13
4.57
4.47
1967
1968
1969

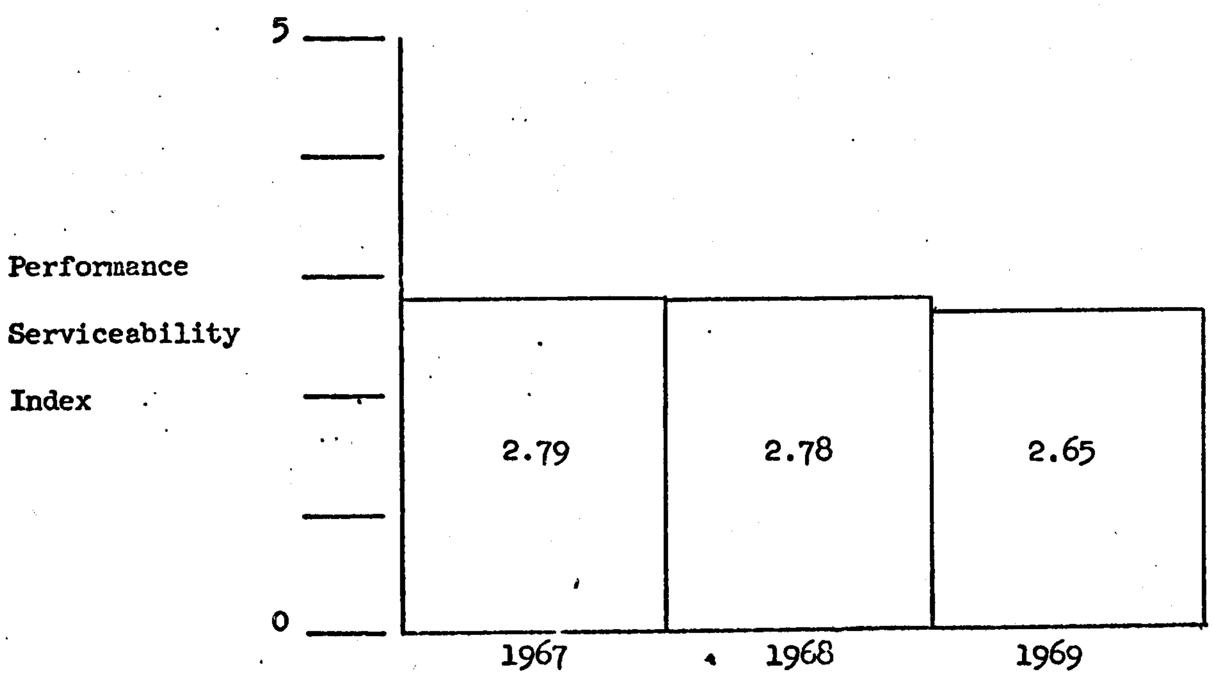
4-13-7


5
0
Performance
Serviceability
Index
4.10
4.59
4.66
1967
1968
1969

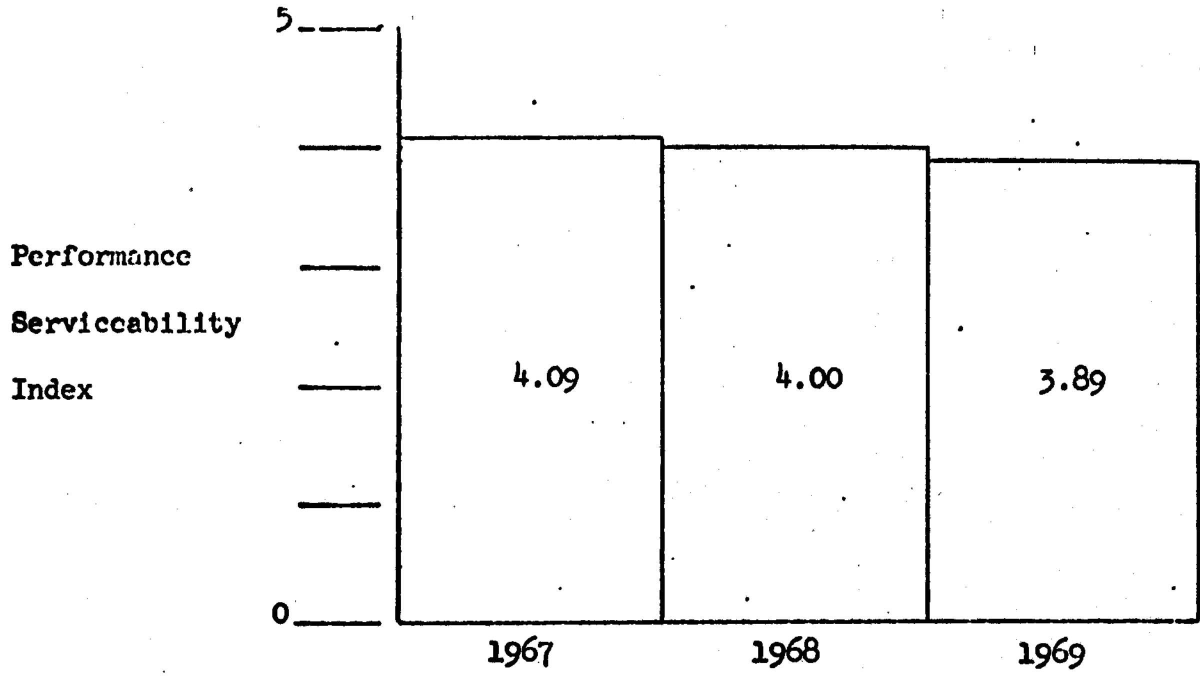
79-4-7


5
0
Performance
Serviceability
Index
4.56
5.08
5.15
1967
1968
1969

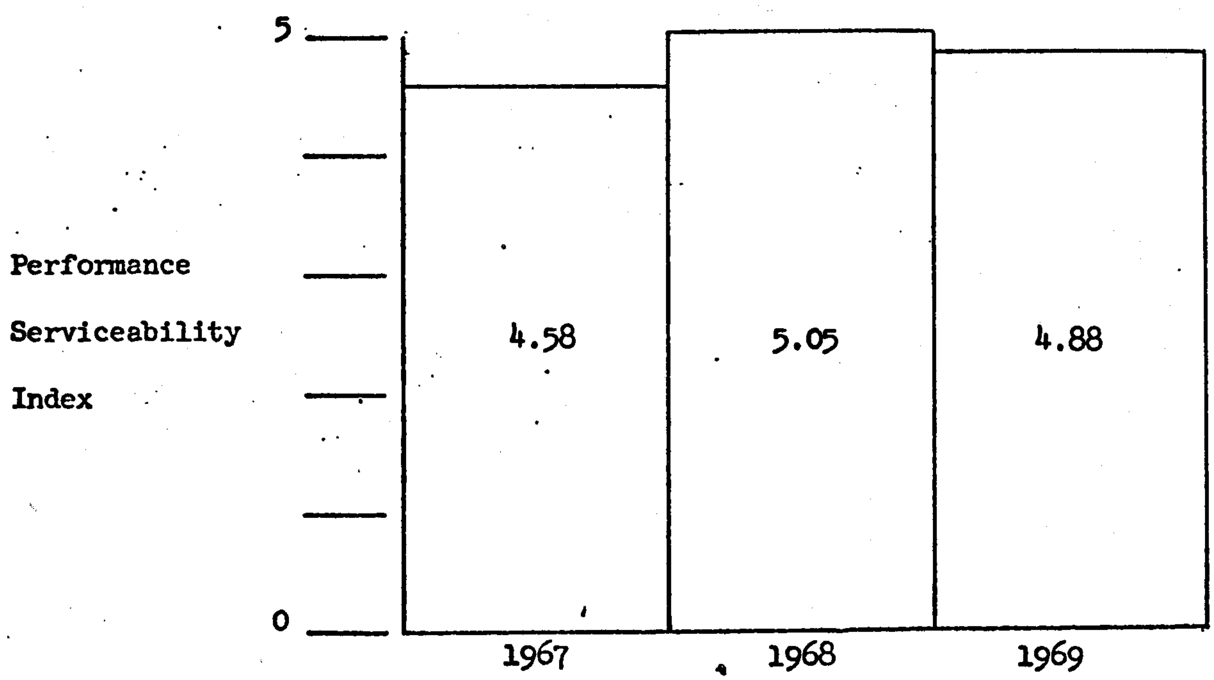
82-4-7


5
0
Performance
Serviceability
Index
2.79
2.78
2.65
1967
1968
1969

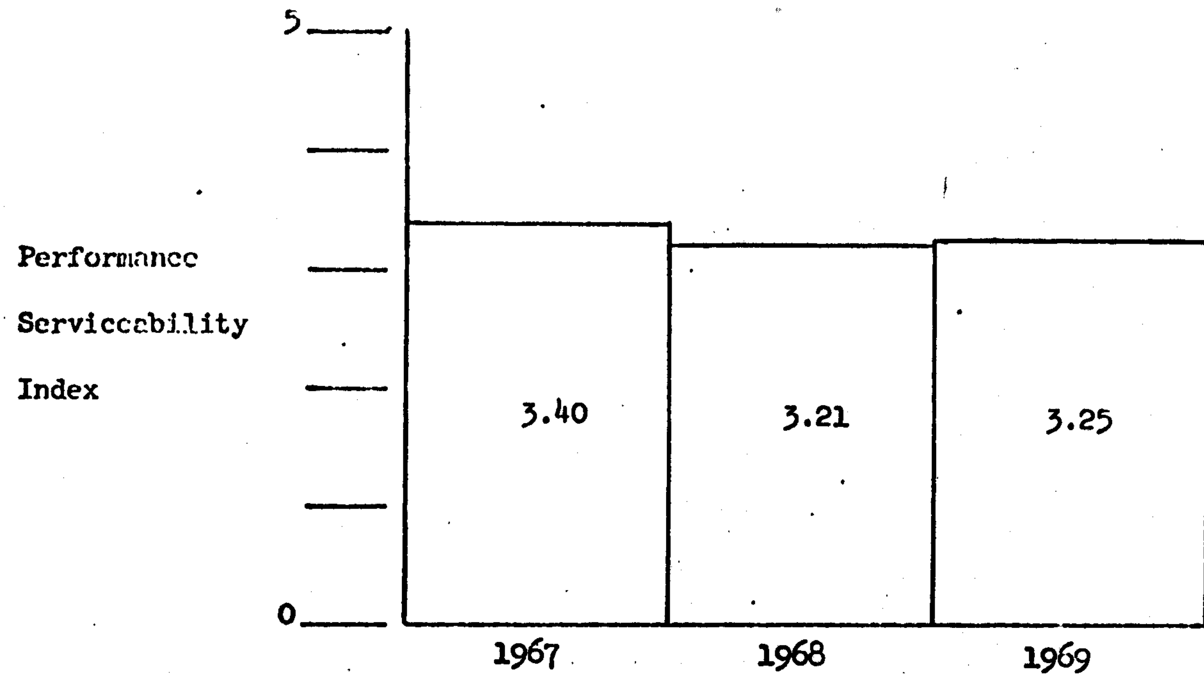
132-1-7



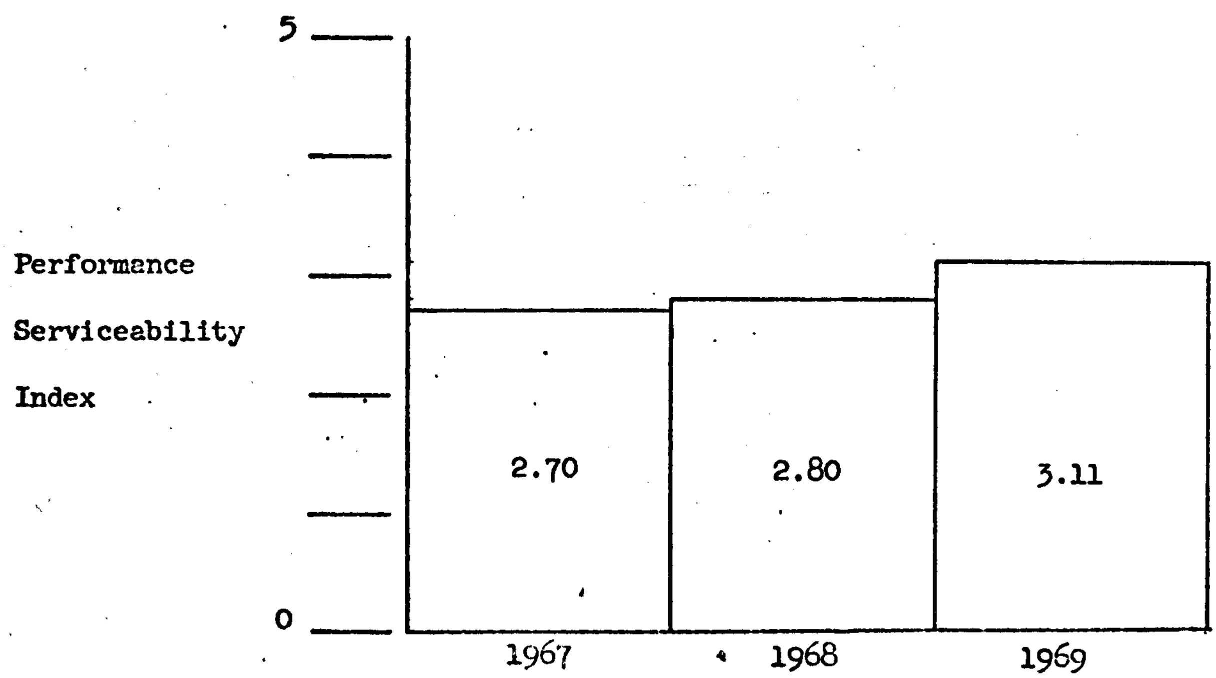
63-3-10



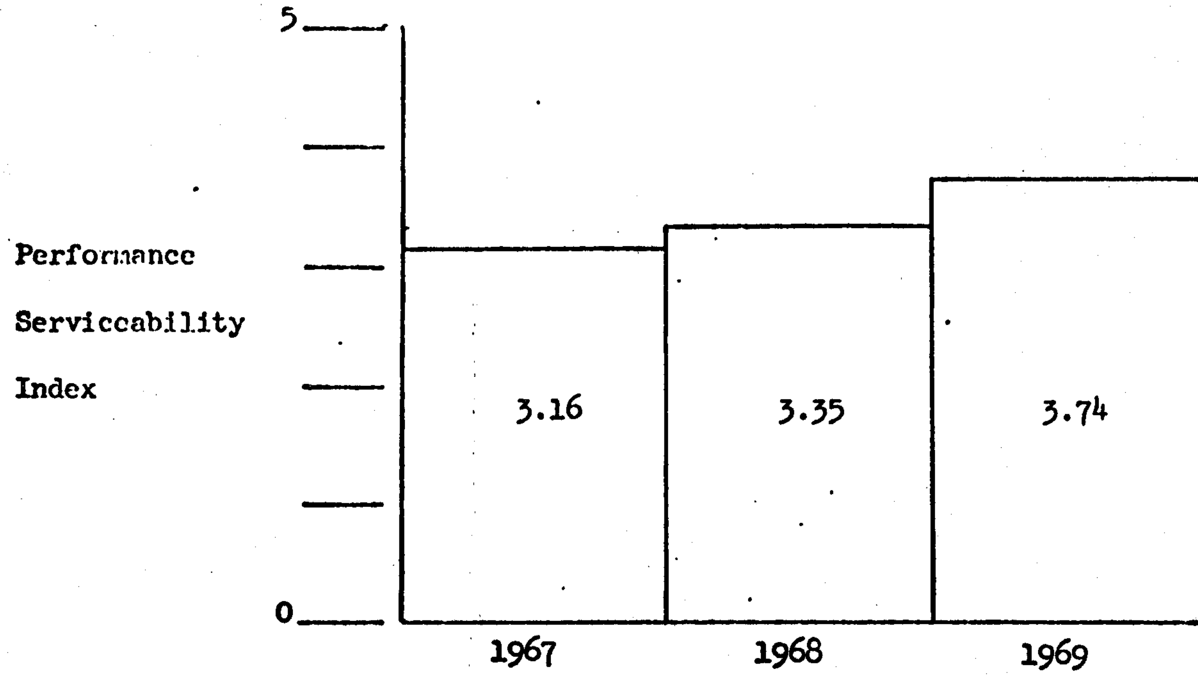
S63-6-10



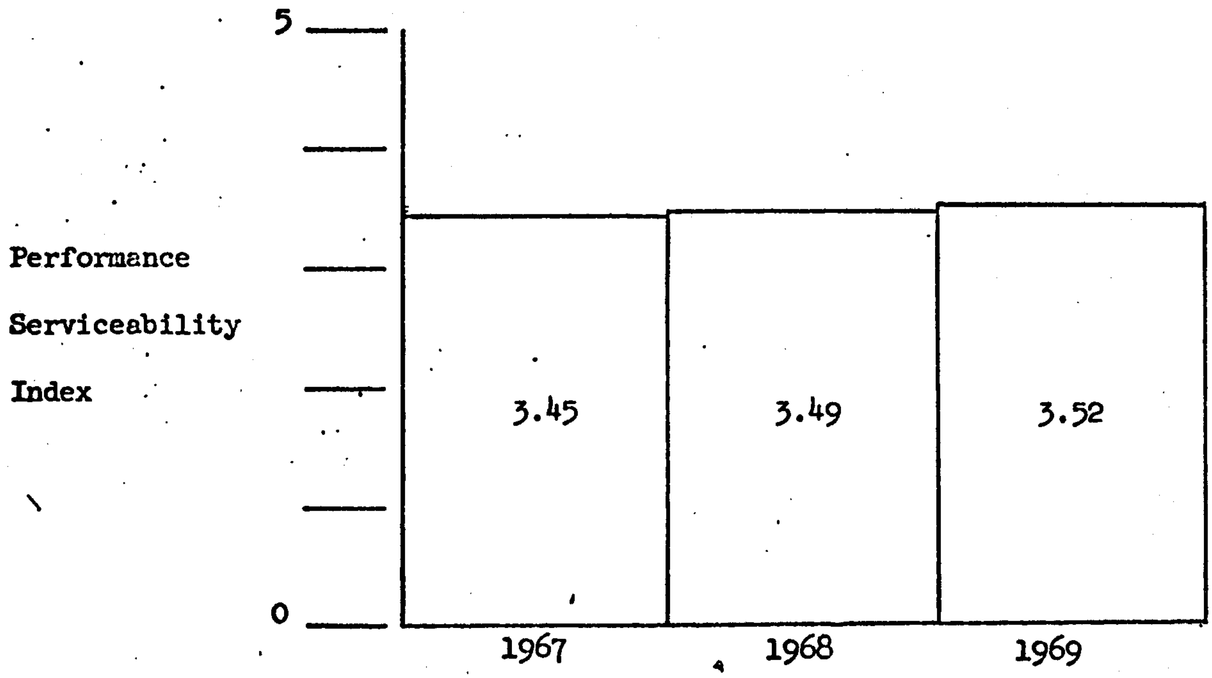
118-2-10



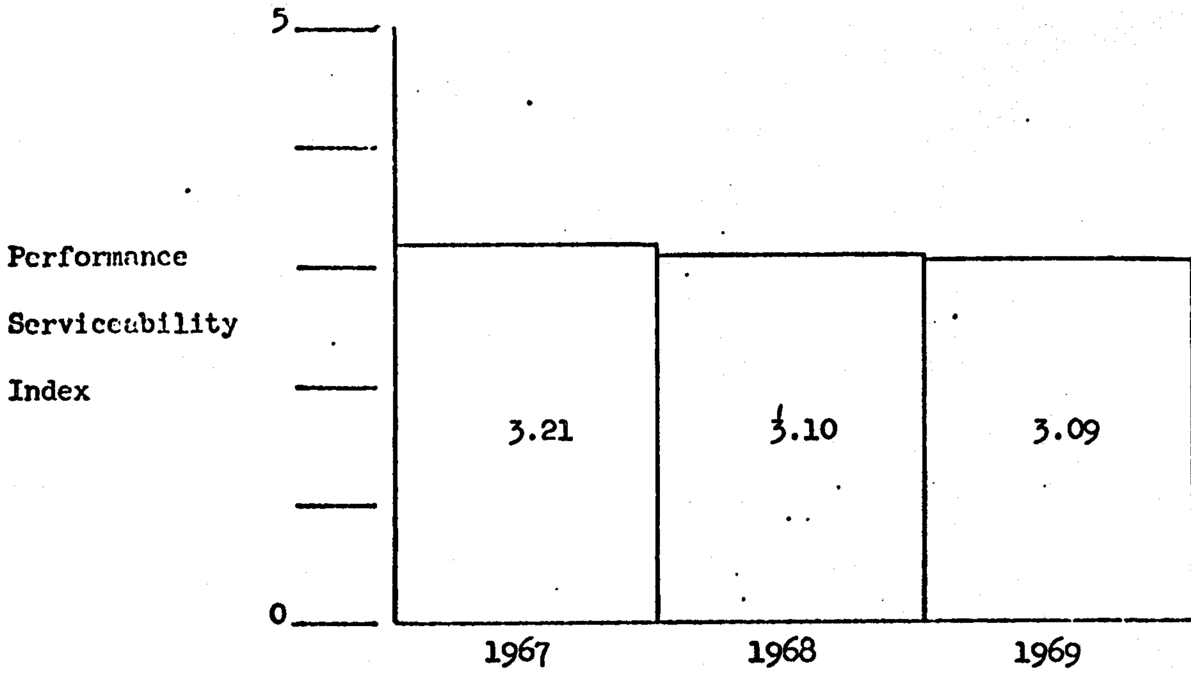
136-0-10



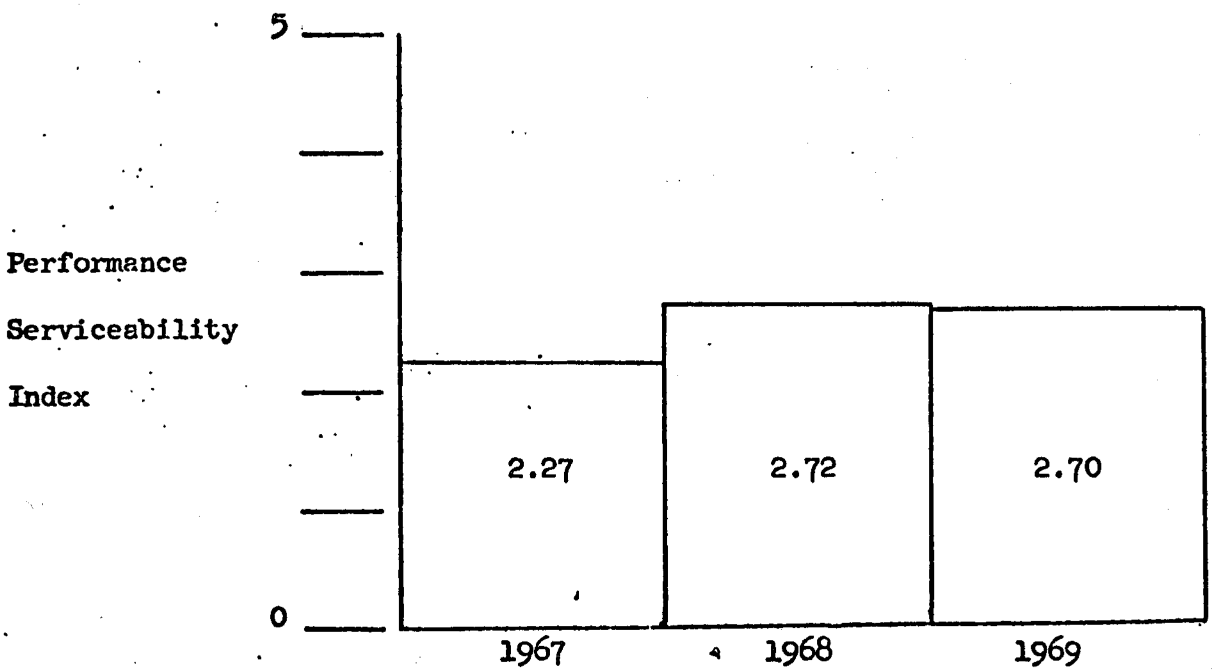
139-2-10



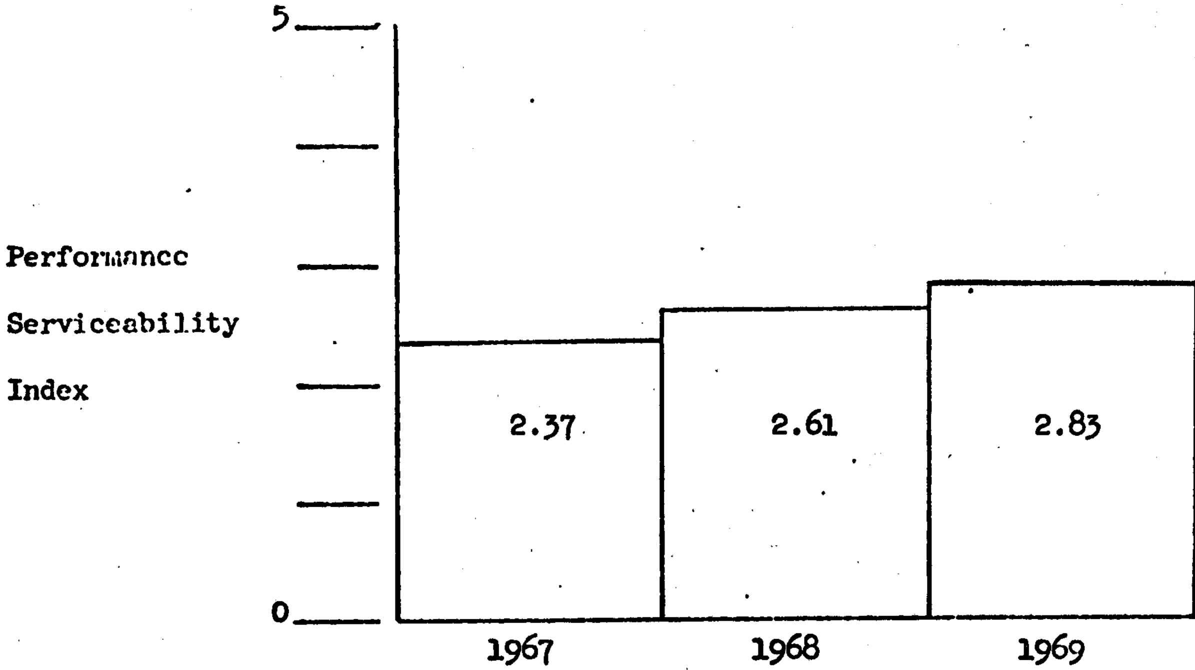
139-5-10



228-1-10



304-1-10


5
Performance
Serviceability
Index
0
2.37
2.61
2.83
1967
1968
1969

312-1-10

APPENDIX B

The following charts represent the layer thicknesses and material identification for the test sites. Borings and classifications were performed by the Arkansas Highway Department. Six borings were equally spaced throughout the site. The terminology "core boring", from the work plan, was interpreted by the Arkansas Highway Department to be synonymous with auger boring. The indicated layer thicknesses are measured in feet. These abbreviations are used:

ACHM - Asphaltic Concrete Hot Mix

DBST - Double Seal

GB - Gravel Base

SB - Sand Base

SM - Select Material

CMEX - Common Excavation

UNFL - Common Excavation

COEX - Common Excavation

OCDM - Old Cold Mix

CDMX - Cold Mix

OLGB - Old Gravel Base

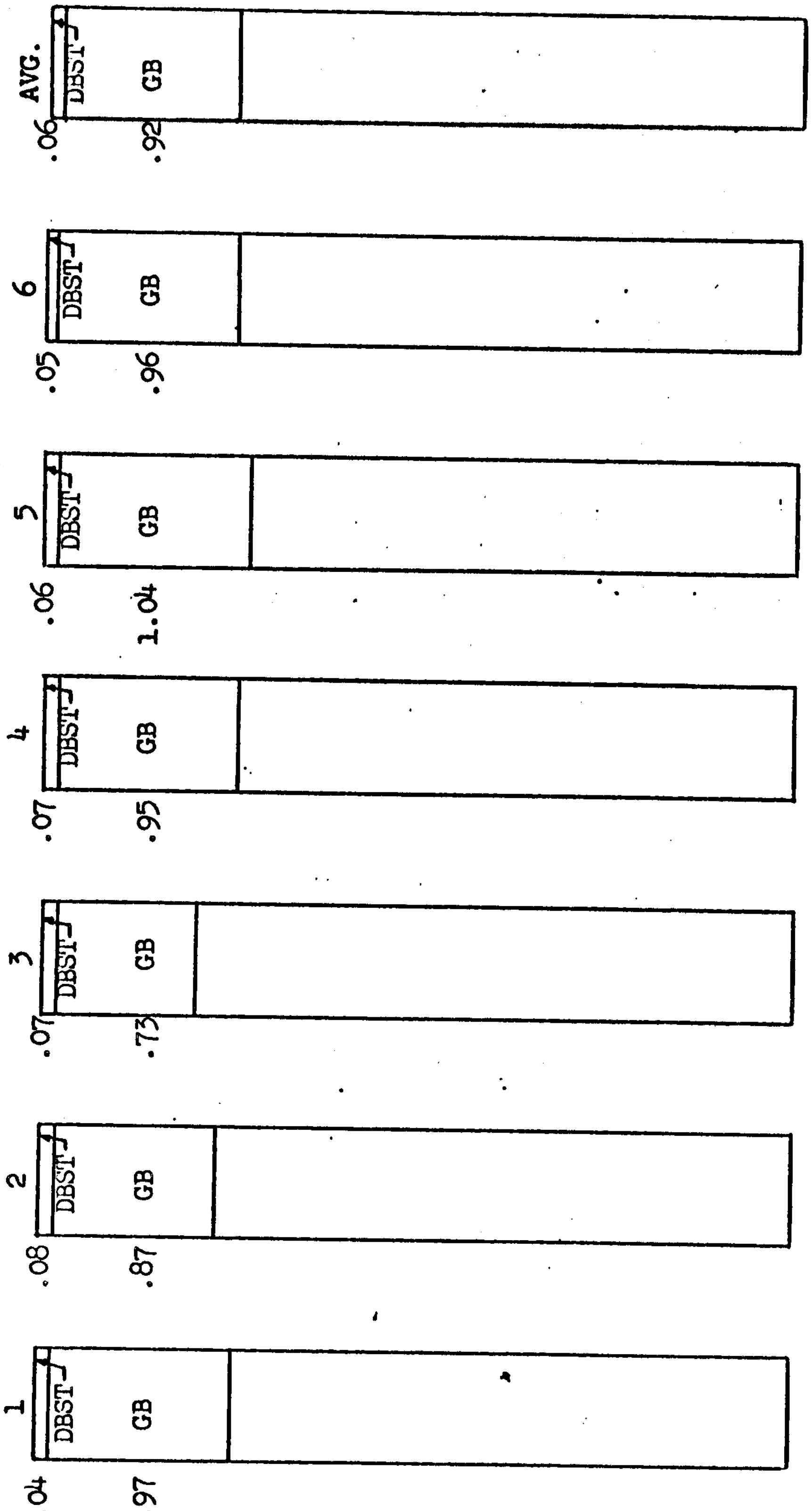
ODGB - Old Gravel Base

UCFL - Unclassified Fill

SMGB - Old Select Material and Gravel Base

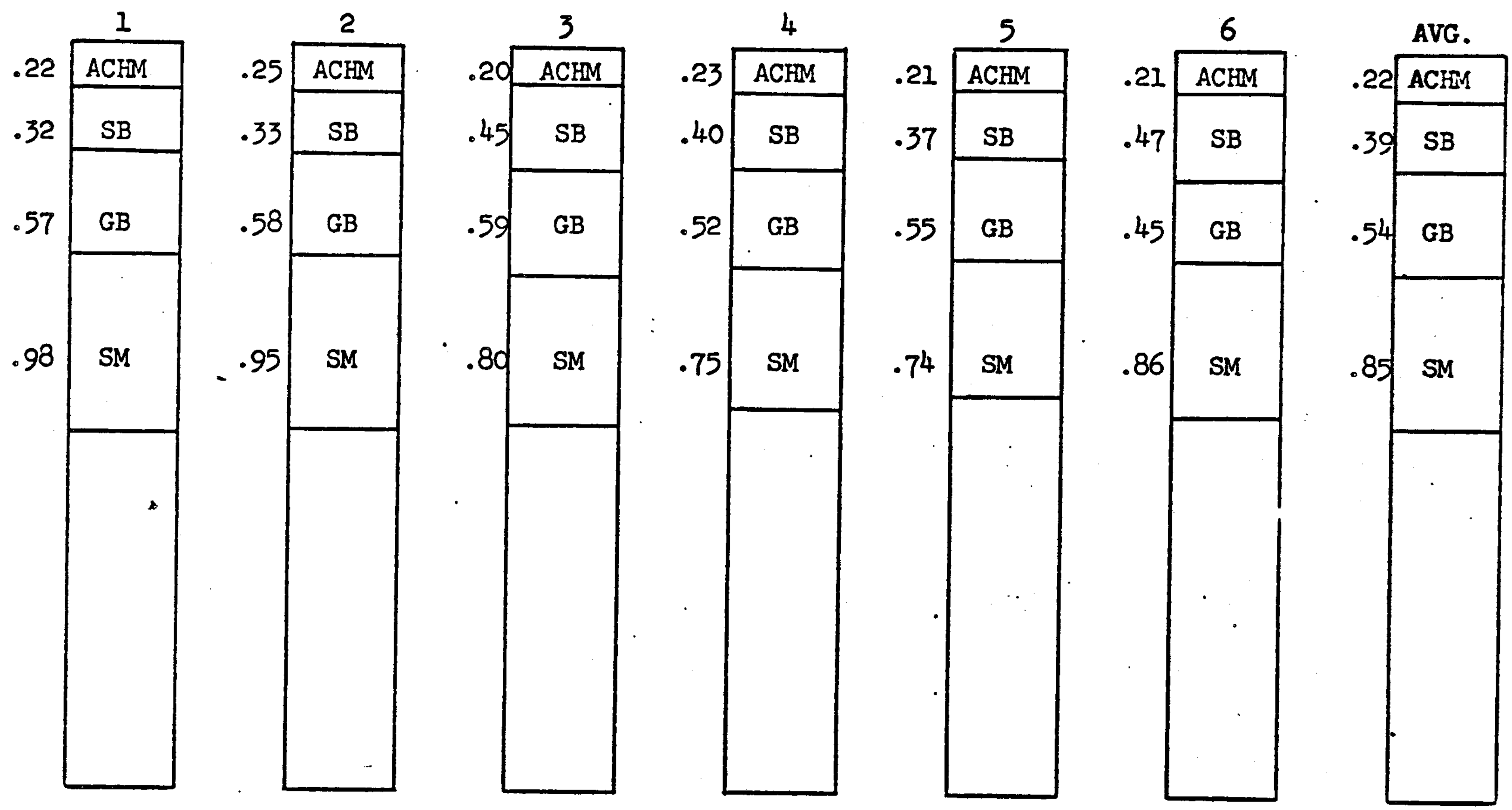
ODAS - Old Asphalt

OHTM - Old Hot Mix

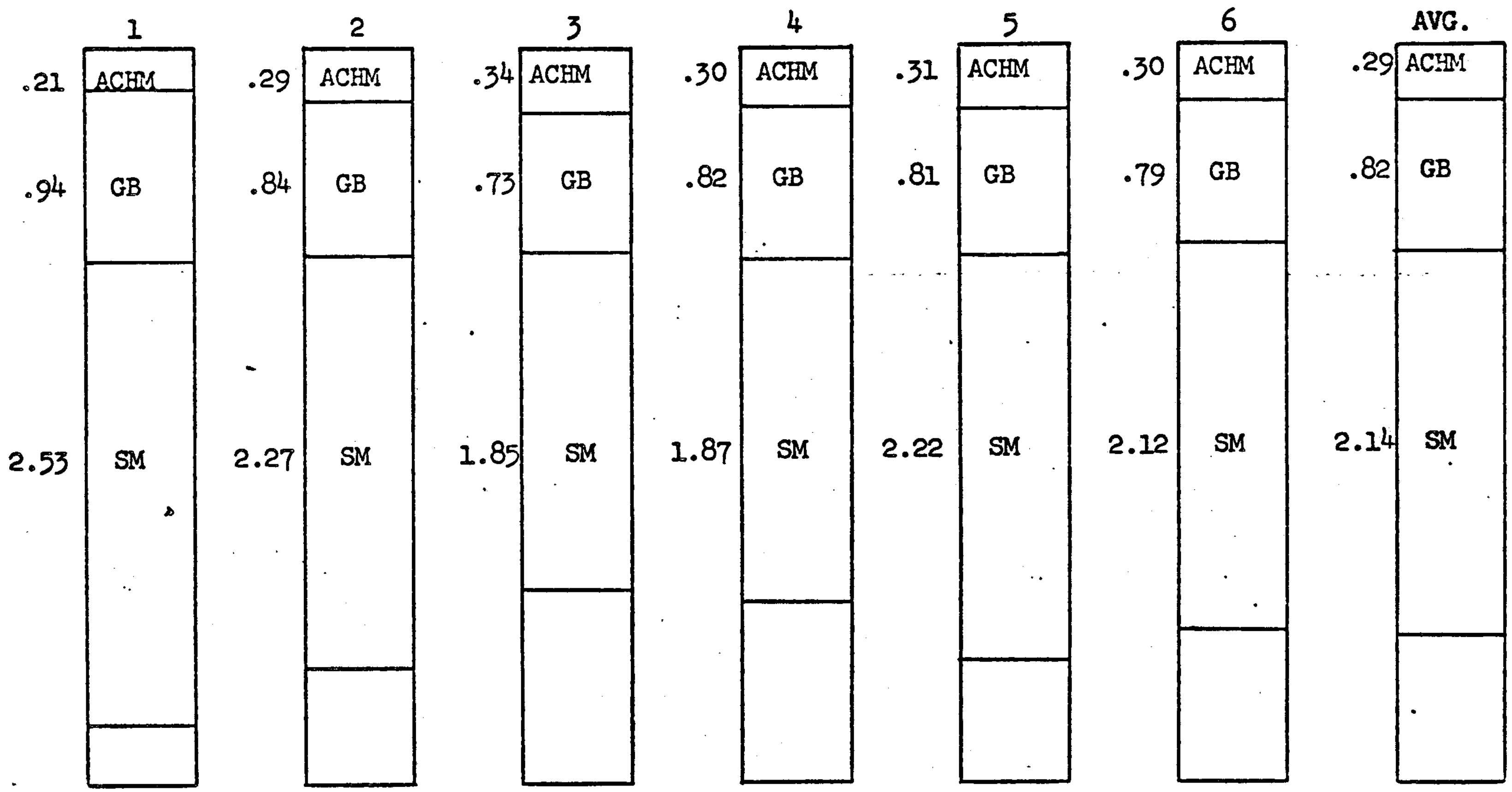


AVG.
DBST
GB
.06
.92
6
DBST
GB
.05
.96
5
DBST
GB
.06
1.04
4
DBST
GB
.07
.95
3
DBST
GB
.07
.73
2
DBST
GB
.08
.87
1
DBST
GB
.04
.97

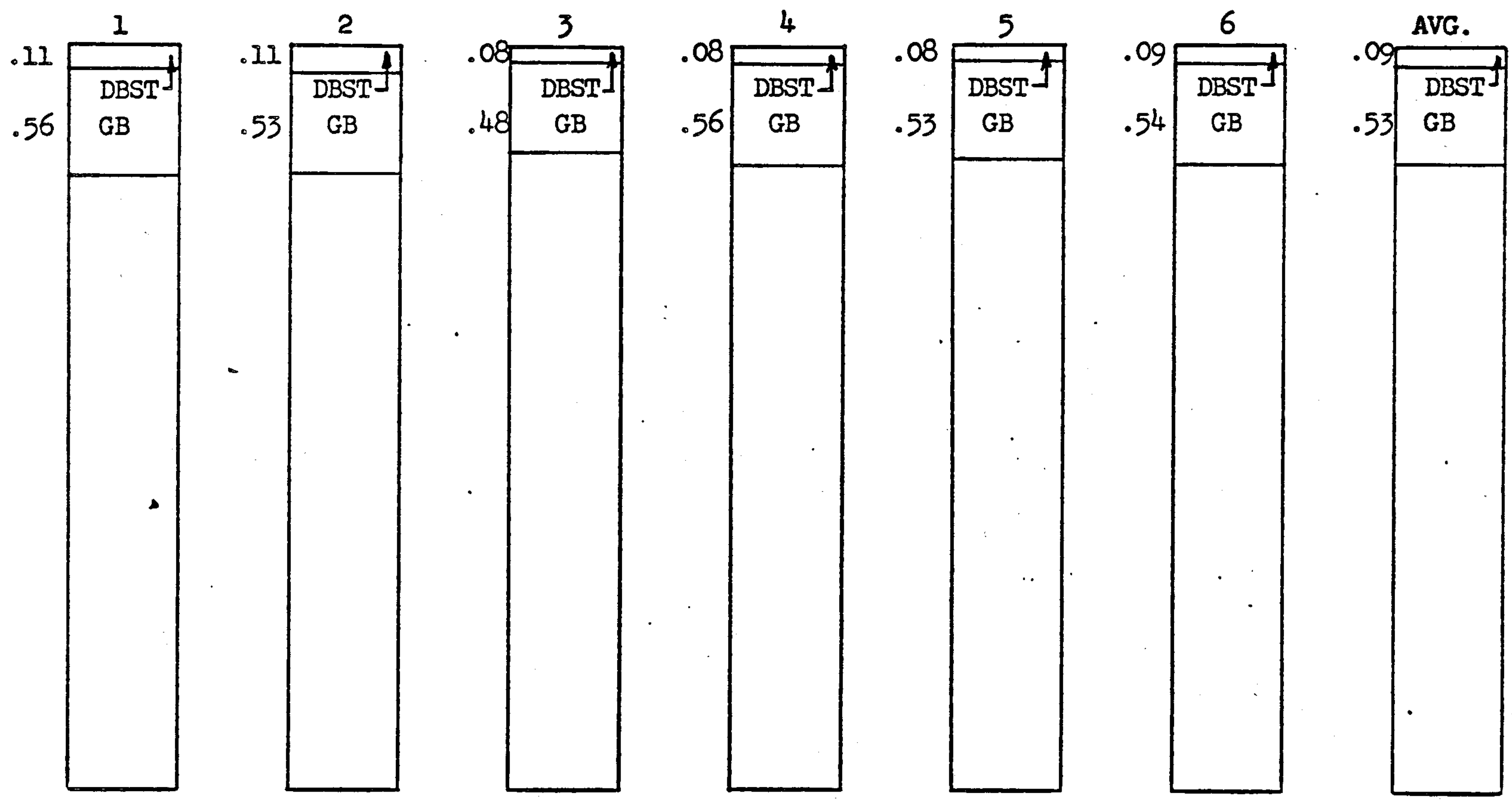
1-7-1


1
.22 ACHM
.32 SB
.57 GB
.98 SM
2
.25 ACHM
.33 SB
.58 GB
.95 SM
3
.20 ACHM
.45 SB
.59 GB
.80 SM
4
.23 ACHM
.40 SB
.52 GB
.75 SM
5
.21 ACHM
.37 SB
.55 GB
.74 SM
6
.21 ACHM
.47 SB
.45 GB
.86 SM
AVG.
.22 ACHM
.39 SB
.54 GB
.85 SM

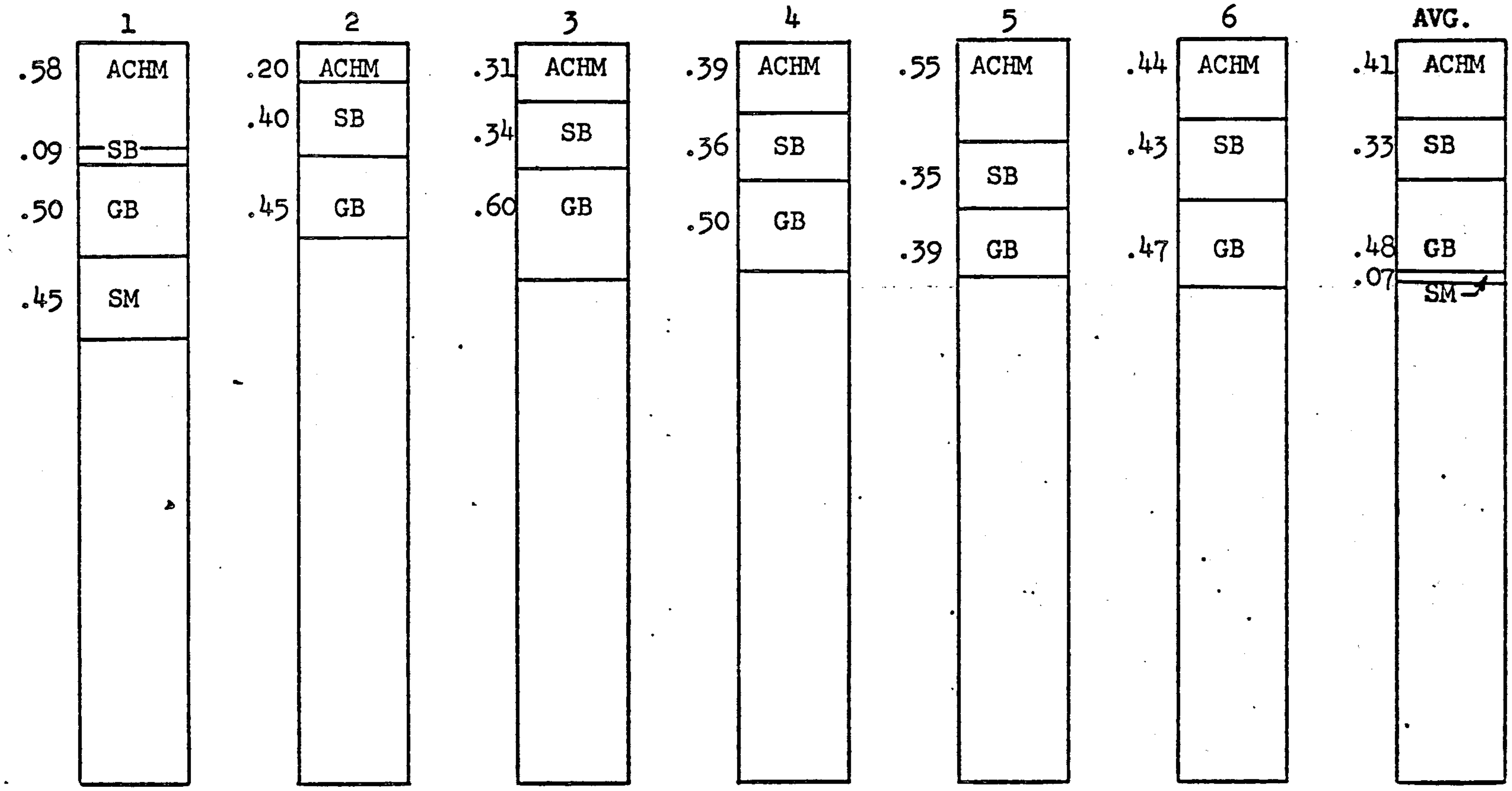
49-1-1


1
2
3
4
5
6
AVG.
.21 ACHM
.94 GB
2.53 SM
.29 ACHM
.84 GB
2.27 SM
.34 ACHM
.73 GB
1.85 SM
.30 ACHM
.82 GB
1.87 SM
.31 ACHM
.81 GB
2.22 SM
.30 ACHM
.79 GB
2.12 SM
.29 ACHM
.82 GB
2.14 SM

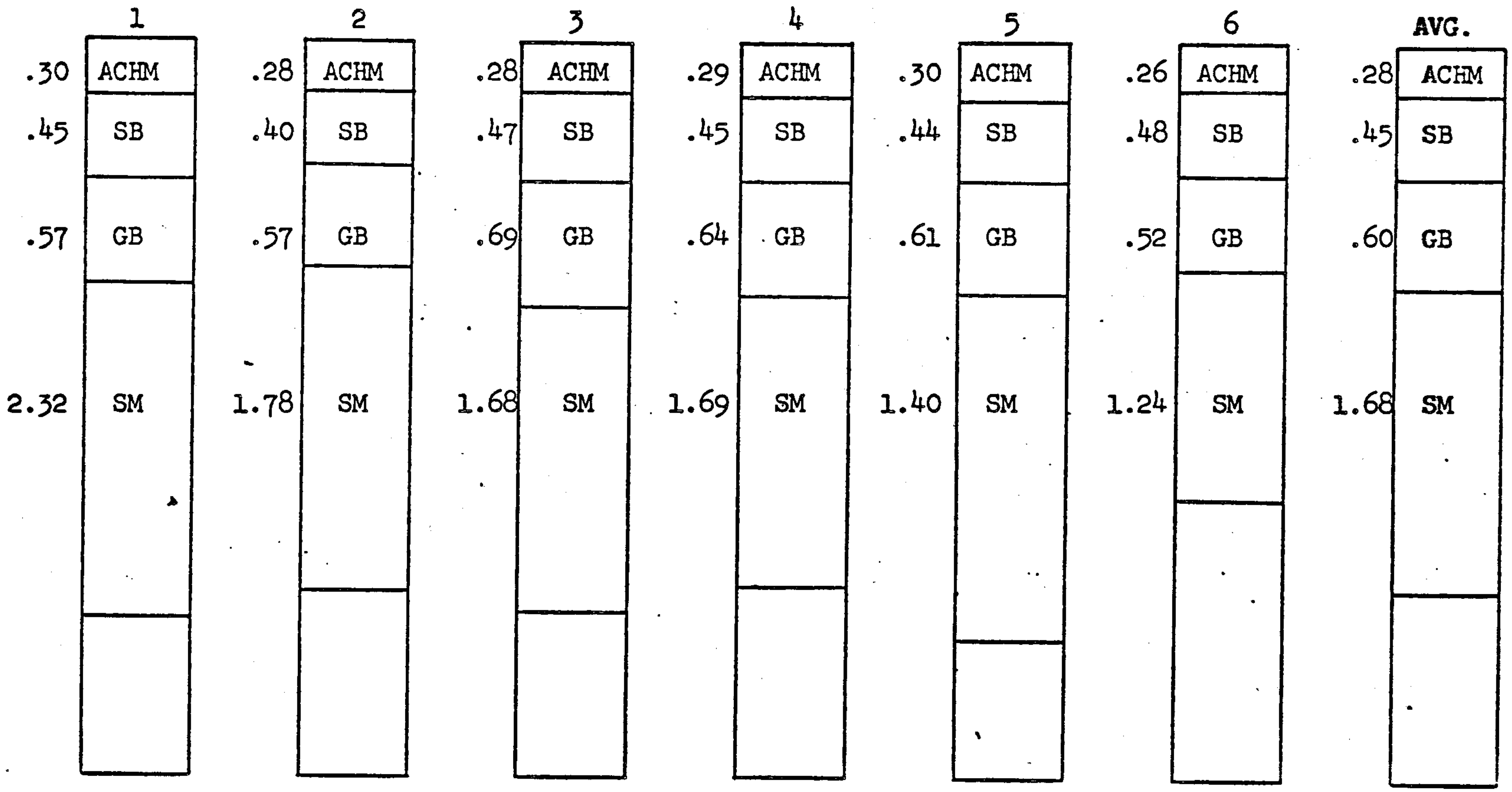
64-17-1


1
.11
DBST
.56
GB
2
.11
DBST
.53
GB
3
.08
DBST
.48
GB
4
.08
DBST
.56
GB
5
.08
DBST
.53
GB
6
.09
DBST
.54
GB
AVG.
.09
DBST
.53
GB

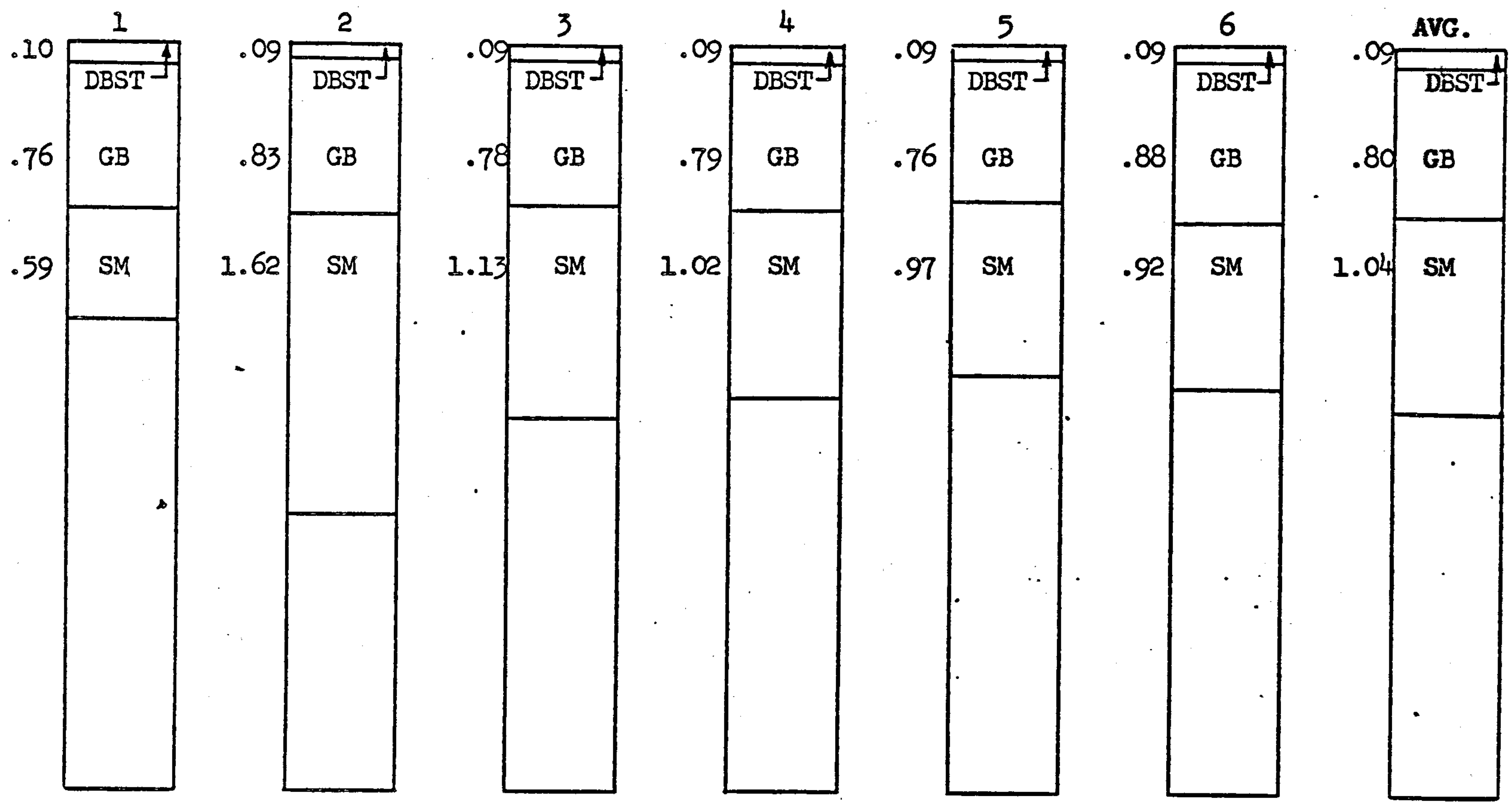
8-14-2


1
.58 ACHM
.09 SB
.50 GB
.45 SM
2
.20 ACHM
.40 SB
.45 GB
3
.31 ACHM
.34 SB
.60 GB
4
.39 ACHM
.36 SB
.50 GB
5
.55 ACHM
.35 SB
.39 GB
6
.44 ACHM
.43 SB
.47 GB
AVG.
.41 ACHM
.33 SB
.48 GB
.07 SM

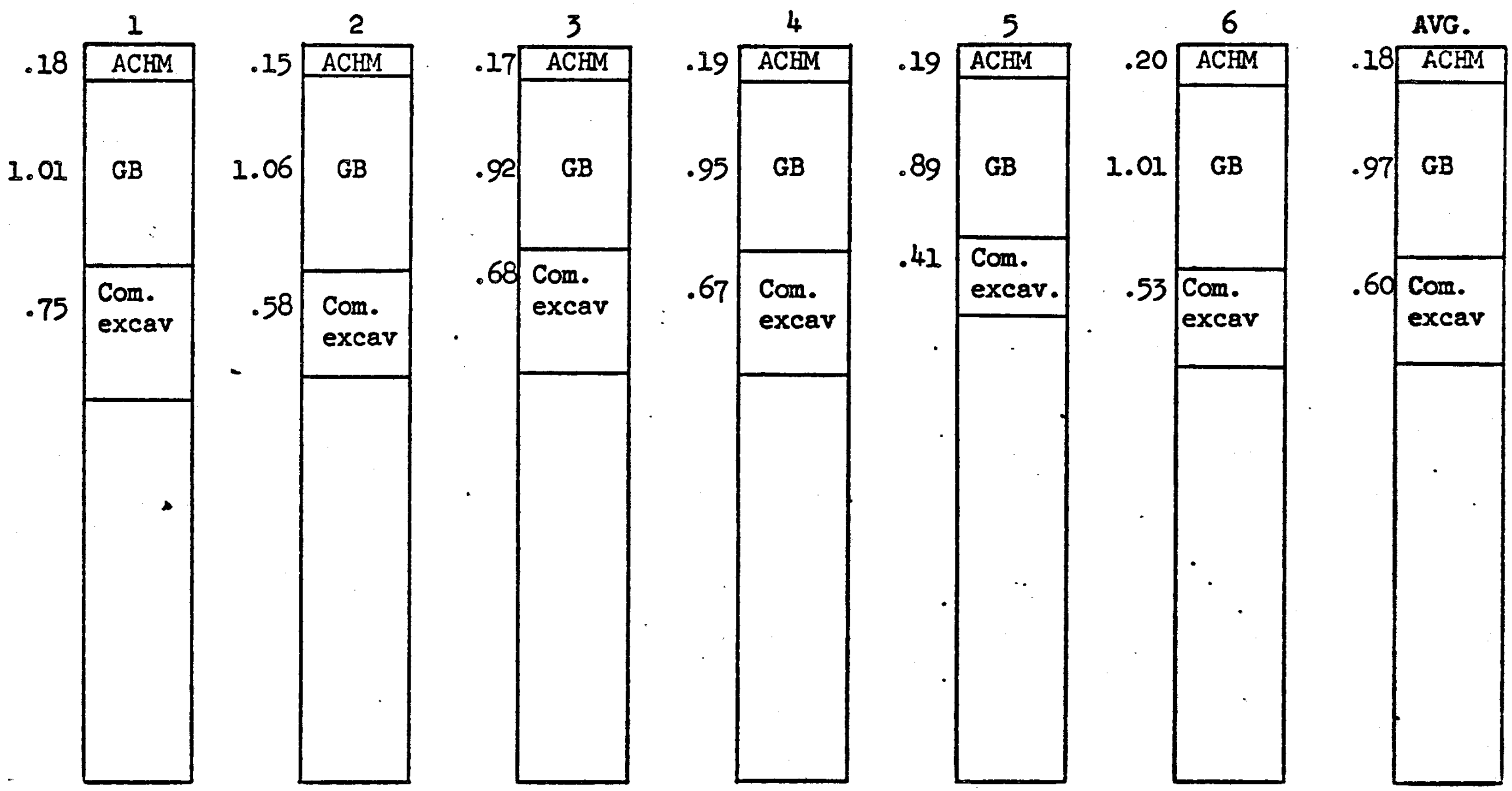
79-7-2


1
.30 ACHM
.45 SB
.57 GB
2.32 SM
2
.28 ACHM
.40 SB
.57 GB
1.78 SM
3
.28 ACHM
.47 SB
.69 GB
1.68 SM
4
.29 ACHM
.45 SB
.64 GB
1.69 SM
5
.30 ACHM
.44 SB
.61 GB
1.40 SM
6
.26 ACHM
.48 SB
.52 GB
1.24 SM
AVG.
.28 ACHM
.45 SB
.60 GB
1.68 SM

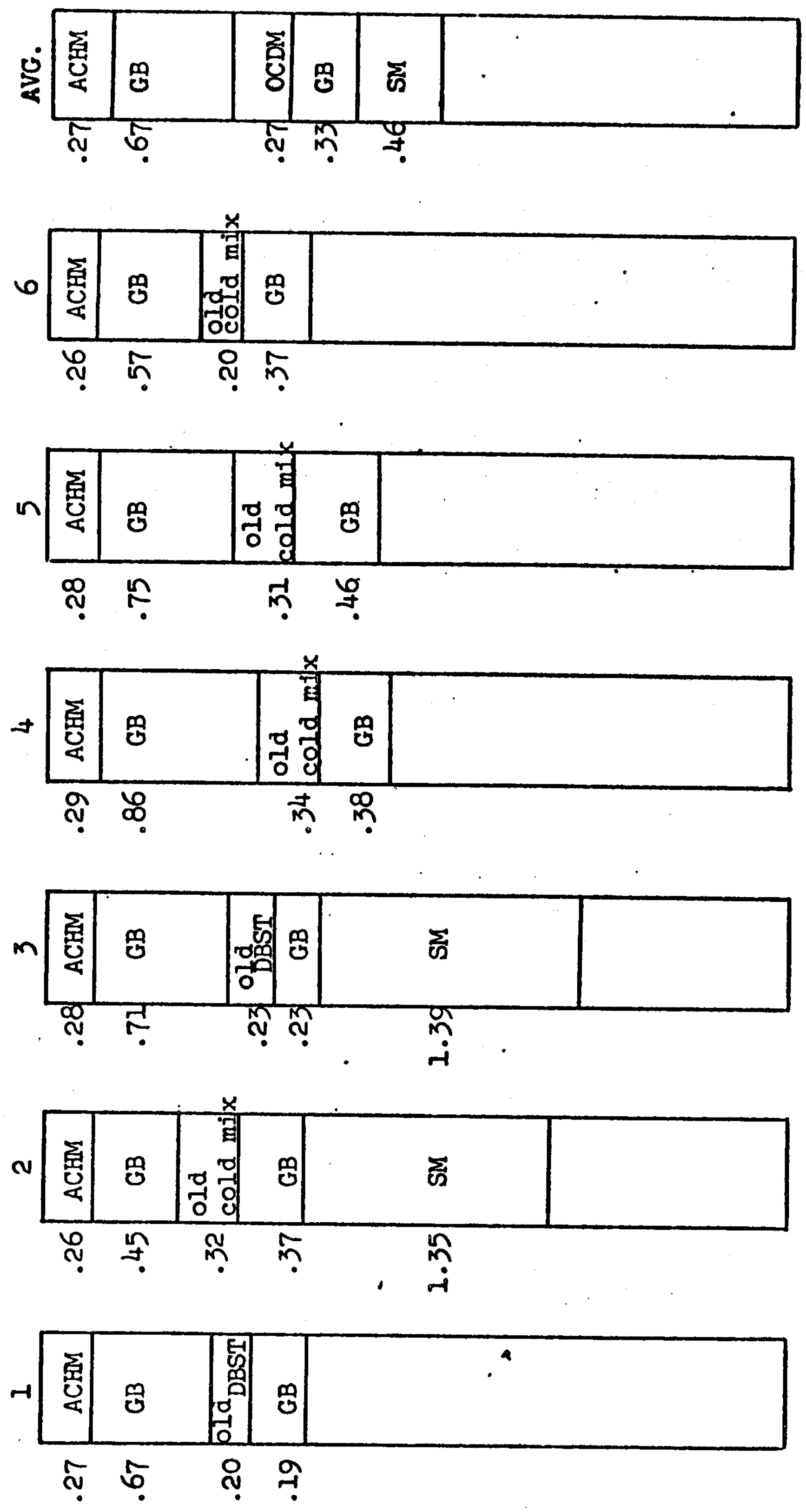
79-10-2


1
2
3
4
5
6
AVG.
.10
.09
.09
.09
.09
.09
.09
DBST
DBST
DBST
DBST
DBST
DBST
DBST
.76
.83
.78
.79
.76
.88
.80
GB
GB
GB
GB
GB
GB
GB
.59
1.62
1.13
1.02
.97
.92
1.04
SM
SM
SM
SM
SM
SM
SM

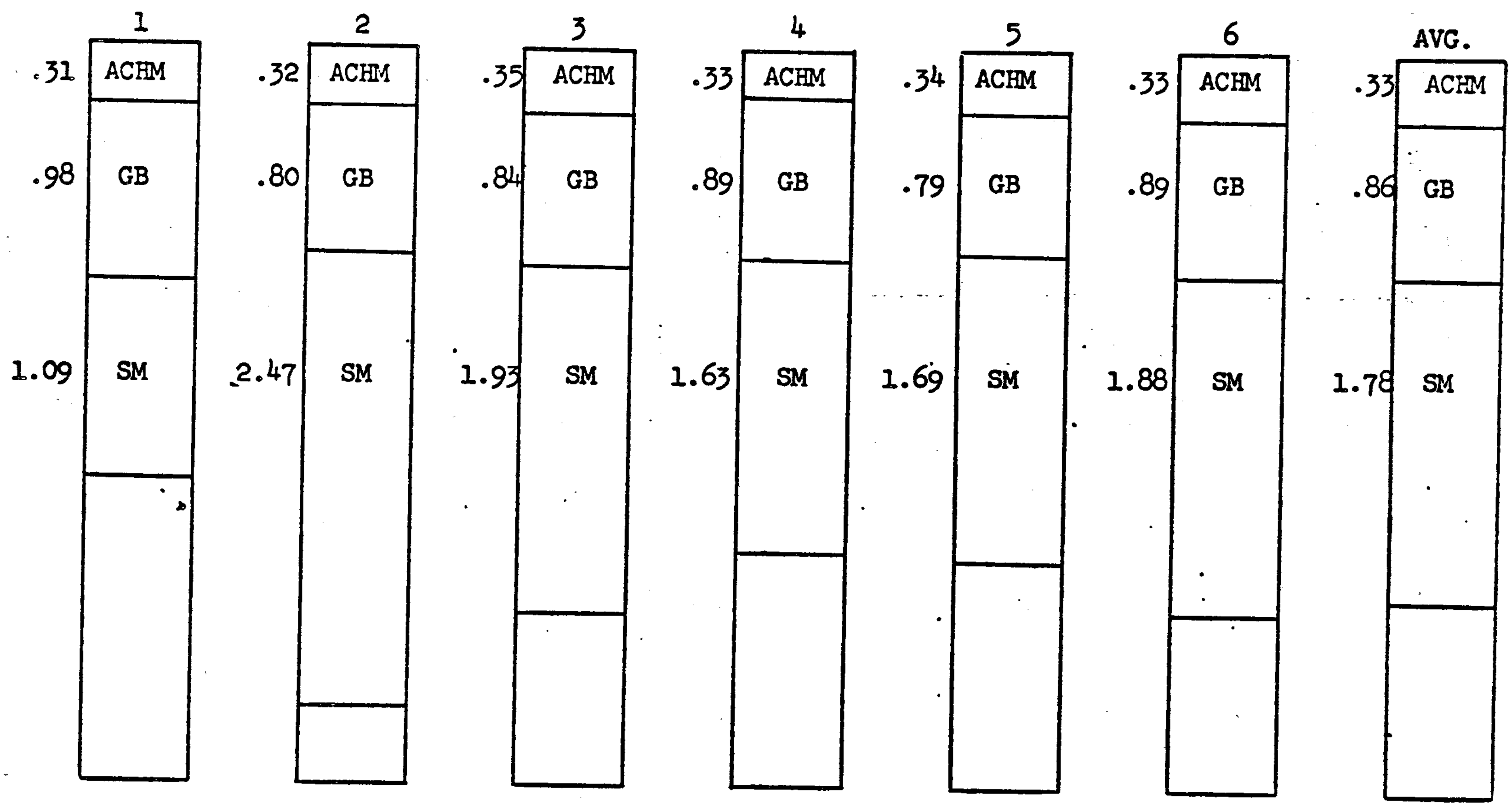
41-3-3


1
.18 ACHM
1.01 GB
.75 Com. excav
2
.15 ACHM
1.06 GB
.58 Com. excav
3
.17 ACHM
.92 GB
.68 Com. excav
4
.19 ACHM
.95 GB
.67 Com. excav
5
.19 ACHM
.89 GB
.41 Com. excav.
6
.20 ACHM
1.01 GB
.53 Com. excav
AVG.
.18 ACHM
.97 GB
.60 Com. excav

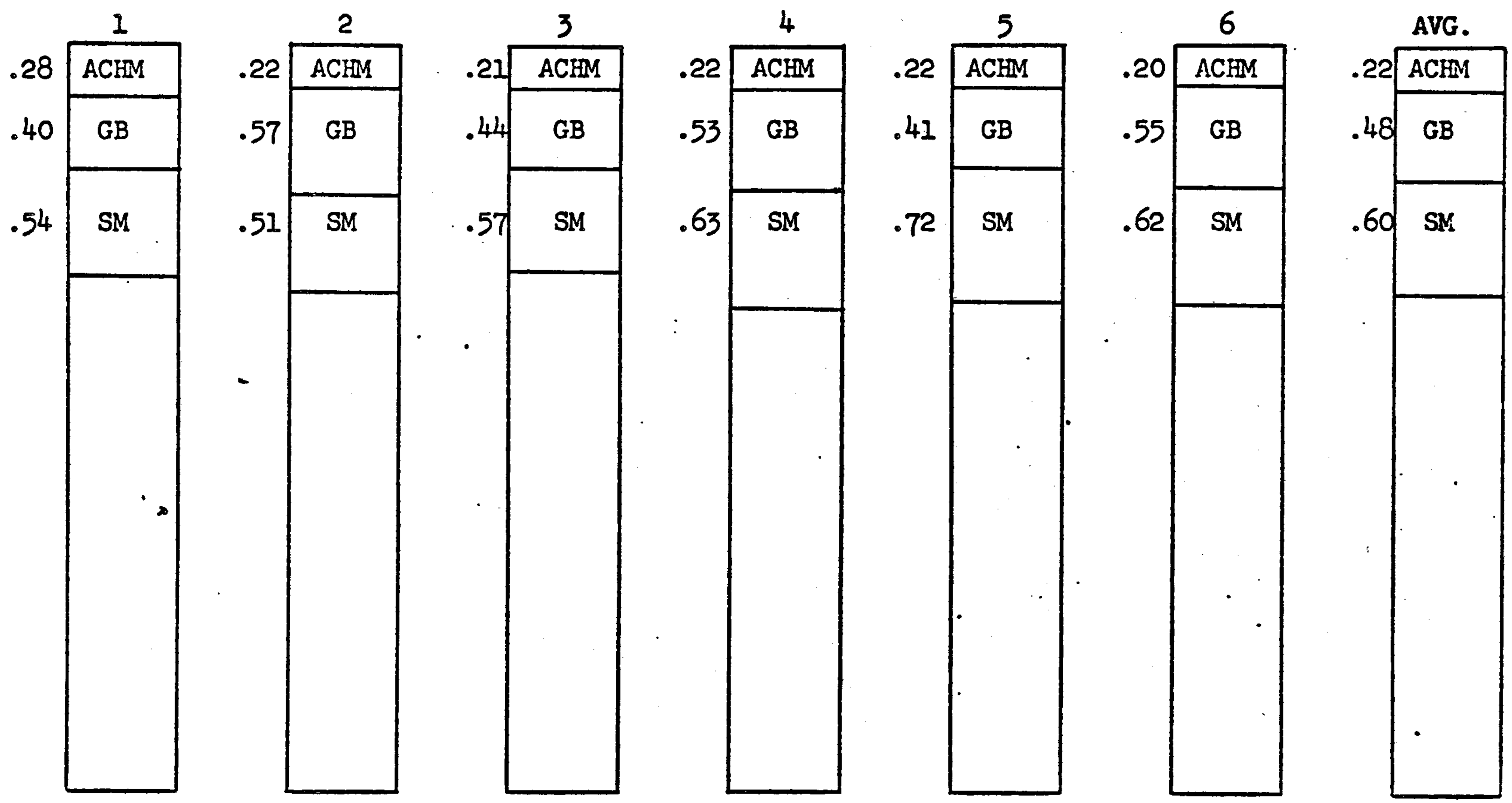
70-5-3


AVG.
ACHM
GB
OCDM
GB
SM
.27
.67
.27
.33
.46
6
ACHM
GB
old cold mix
GB
.26
.57
.20
.37
5
ACHM
GB
old cold mix
GB
.28
.75
.31
.46
4
ACHM
GB
old cold mix
GB
.29
.86
.34
.38
3
ACHM
GB
old DBST
GB
SM
.28
.71
.23
.23
1.39
2
ACHM
GB
old cold mix
GB
SM
.26
.45
.32
.37
1.35
1
ACHM
GB
old DBST
GB
.27
.67
.20
.19

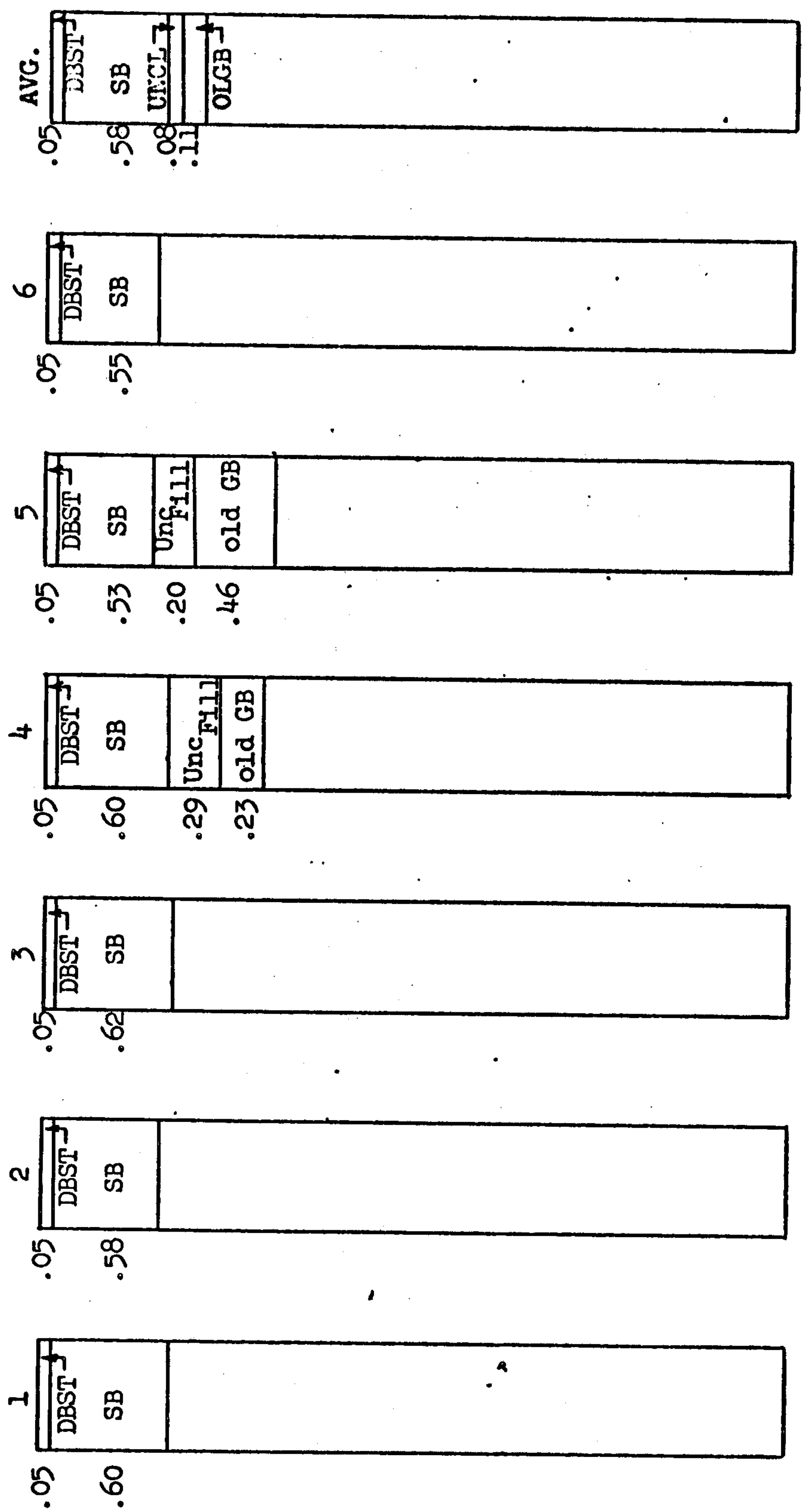
71-2-3


1
.31 ACHM
.98 GB
1.09 SM
2
.32 ACHM
.80 GB
2.47 SM
3
.35 ACHM
.84 GB
1.93 SM
4
.33 ACHM
.89 GB
1.63 SM
5
.34 ACHM
.79 GB
1.69 SM
6
.33 ACHM
.89 GB
1.88 SM
AVG.
.33 ACHM
.86 GB
1.78 SM

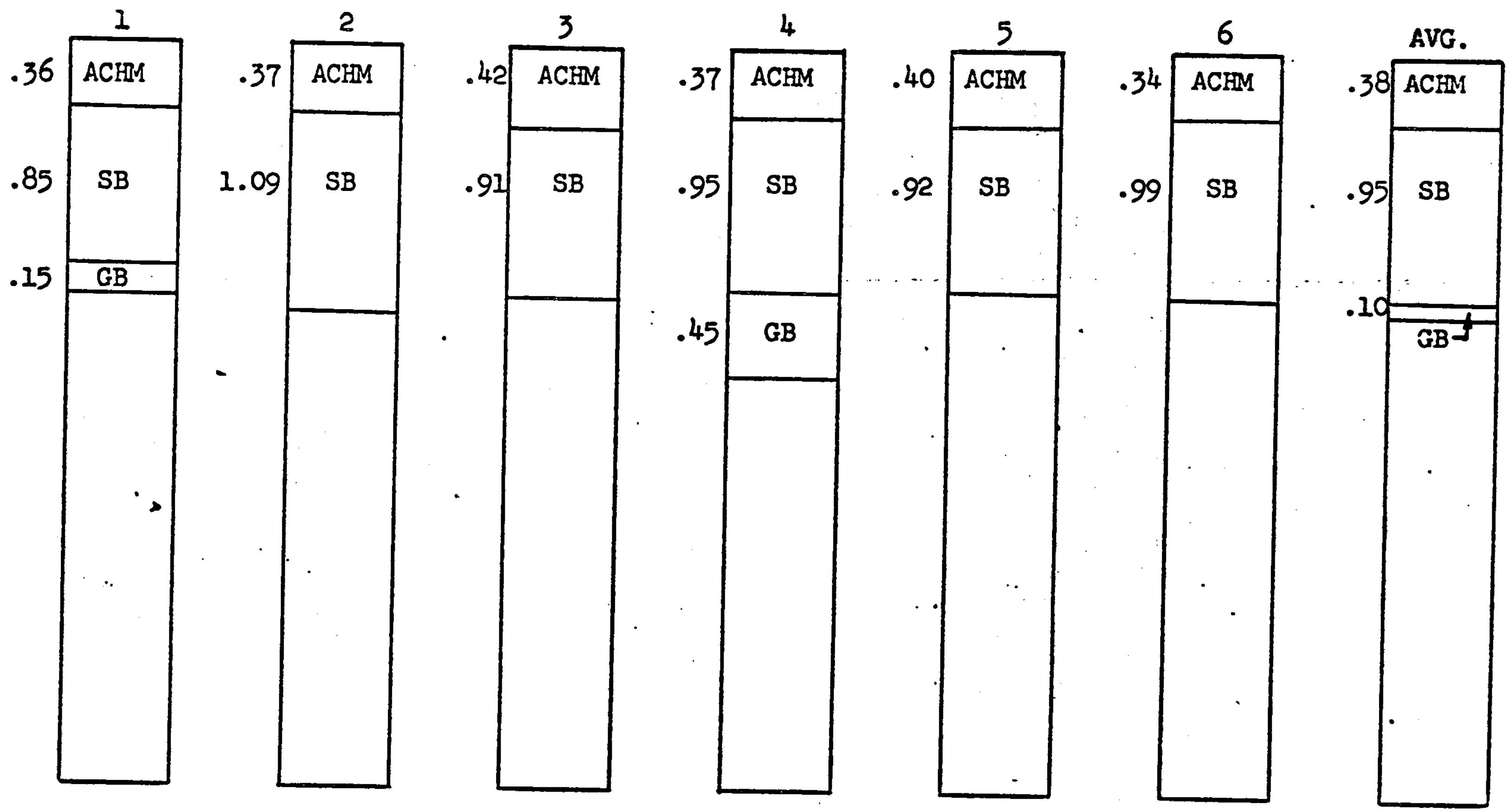
71-5-3


1
.28 ACHM
.40 GB
.54 SM
2
.22 ACHM
.57 GB
.51 SM
3
.21 ACHM
.44 GB
.57 SM
4
.22 ACHM
.53 GB
.63 SM
5
.22 ACHM
.41 GB
.72 SM
6
.20 ACHM
.55 GB
.62 SM
AVG.
.22 ACHM
.48 GB
.60 SM

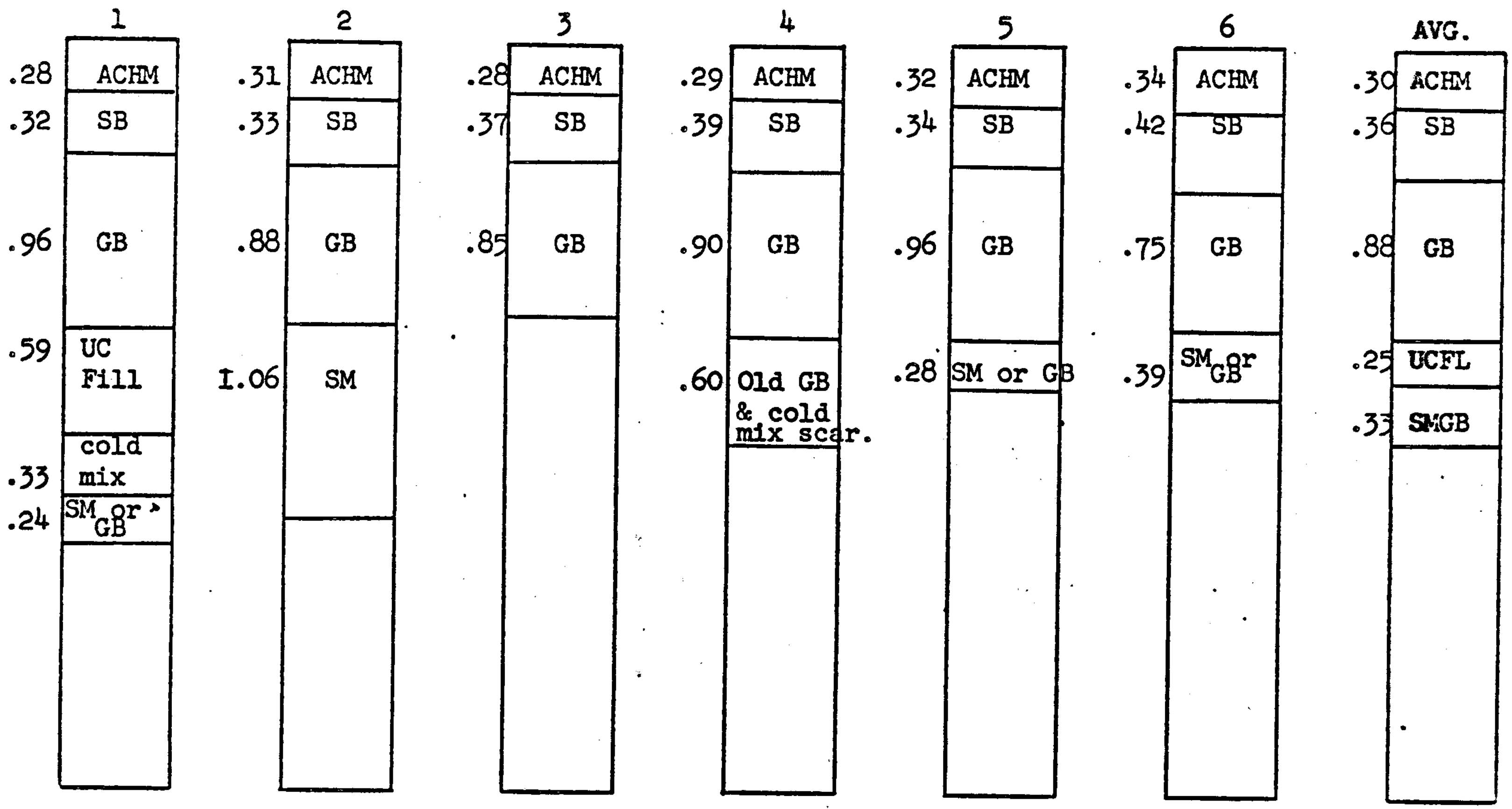
82-1-3


AVG.
DBST
SB
UNCL
OLGB
.05
.58
.08
.11
6
.55
5
Unc Fill
old GB
.53
.20
.46
4
.60
.29
.23
3
.62
2
1

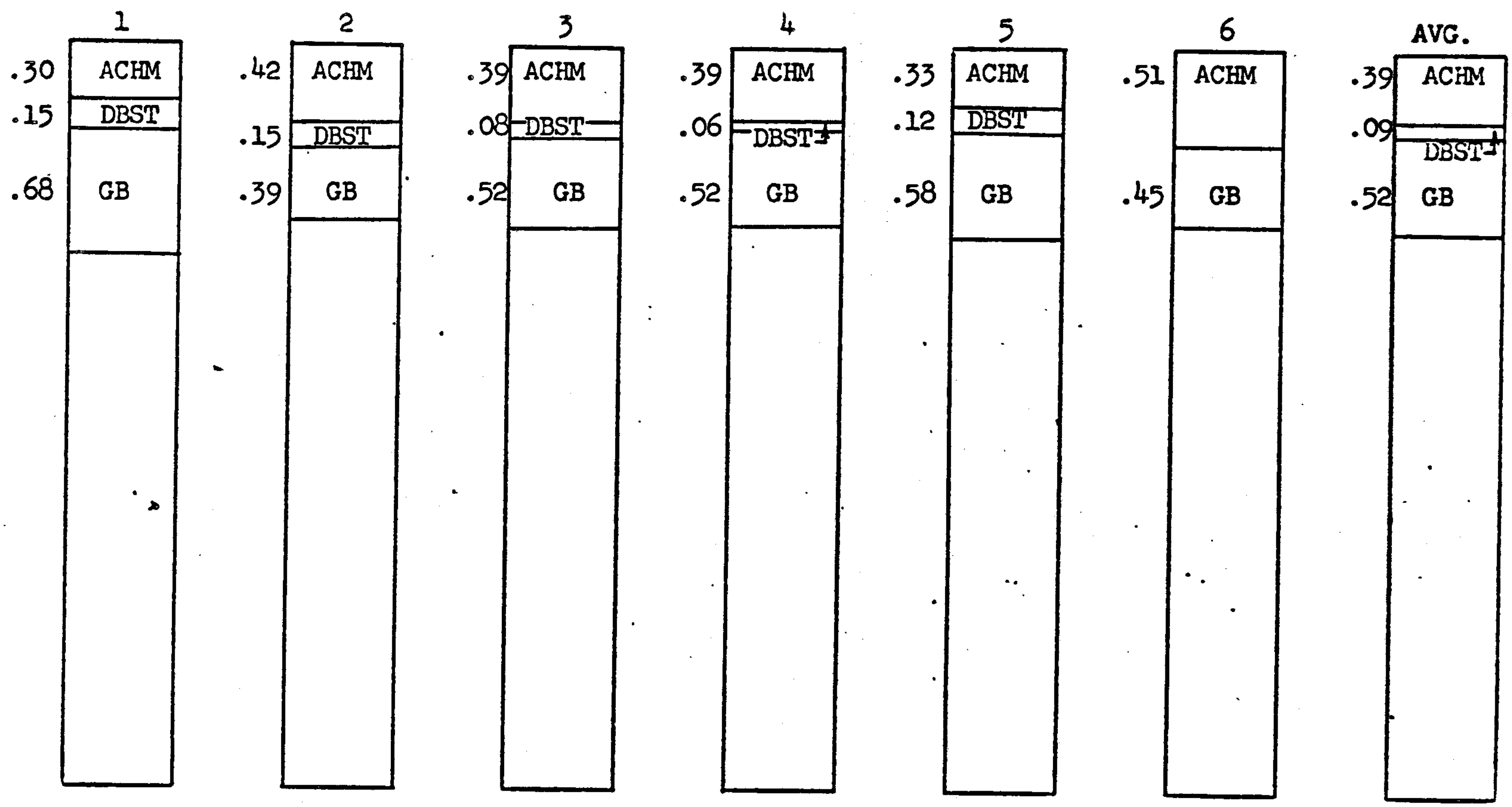
13-10-6


1
.36 ACHM
.85 SB
.15 GB
2
.37 ACHM
1.09 SB
3
.42 ACHM
.91 SB
4
.37 ACHM
.95 SB
.45 GB
5
.40 ACHM
.92 SB
6
.34 ACHM
.99 SB
AVG.
.38 ACHM
.95 SB
.10 GB

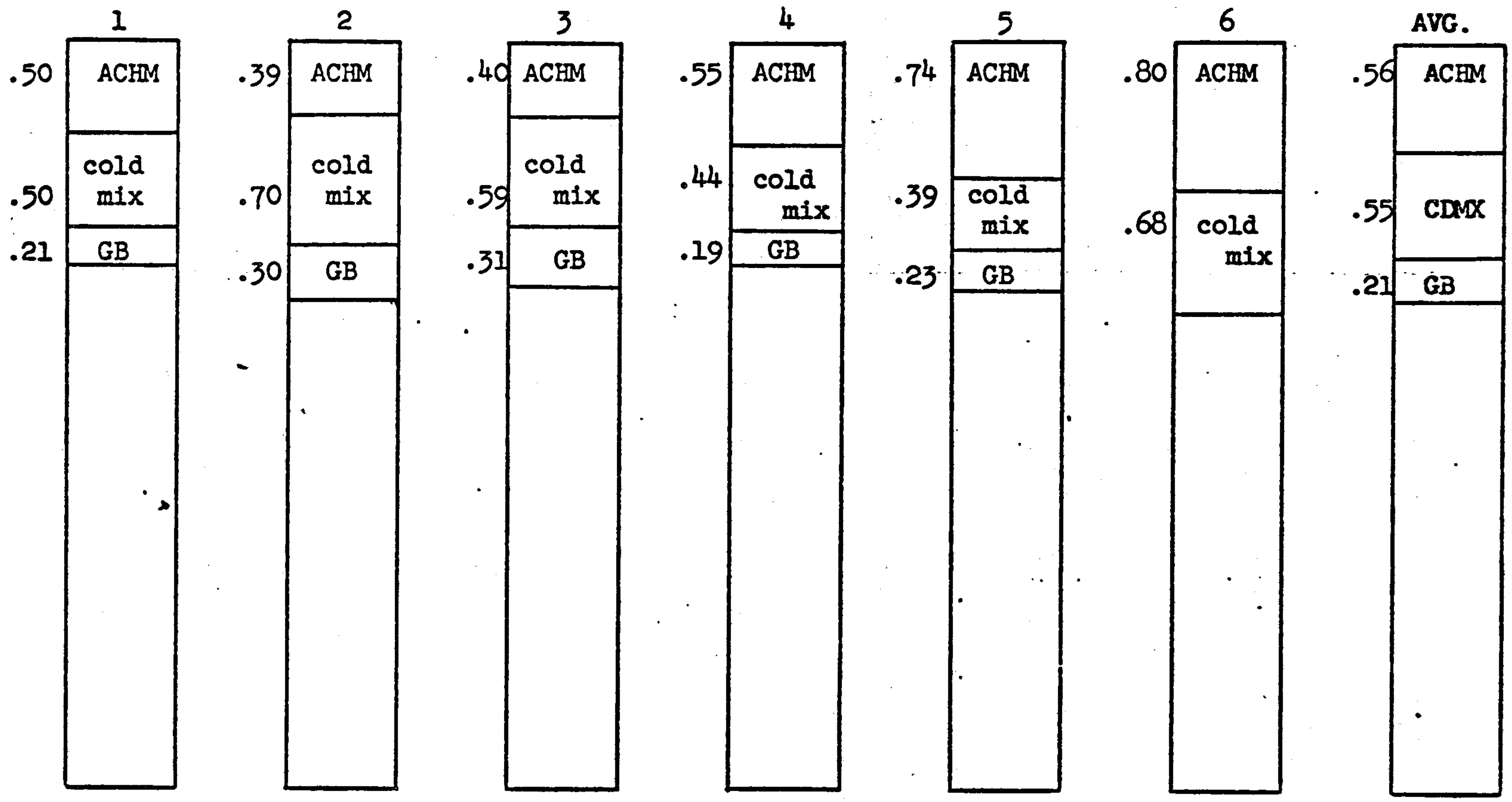
70-10-6


1
.28 ACHM
.32 SB
.96 GB
.59 UC Fill
cold
.33 mix
.24 SM or GB
2
.31 ACHM
.33 SB
.88 GB
I.06 SM
3
.28 ACHM
.37 SB
.85 GB
4
.29 ACHM
.39 SB
.90 GB
.60 Old GB & cold mix scar.
5
.32 ACHM
.34 SB
.96 GB
.28 SM or GB
6
.34 ACHM
.42 SB
.75 GB
.39 SM or GB
AVG.
.30 ACHM
.36 SB
.88 GB
.25 UCFL
.33 SMGB

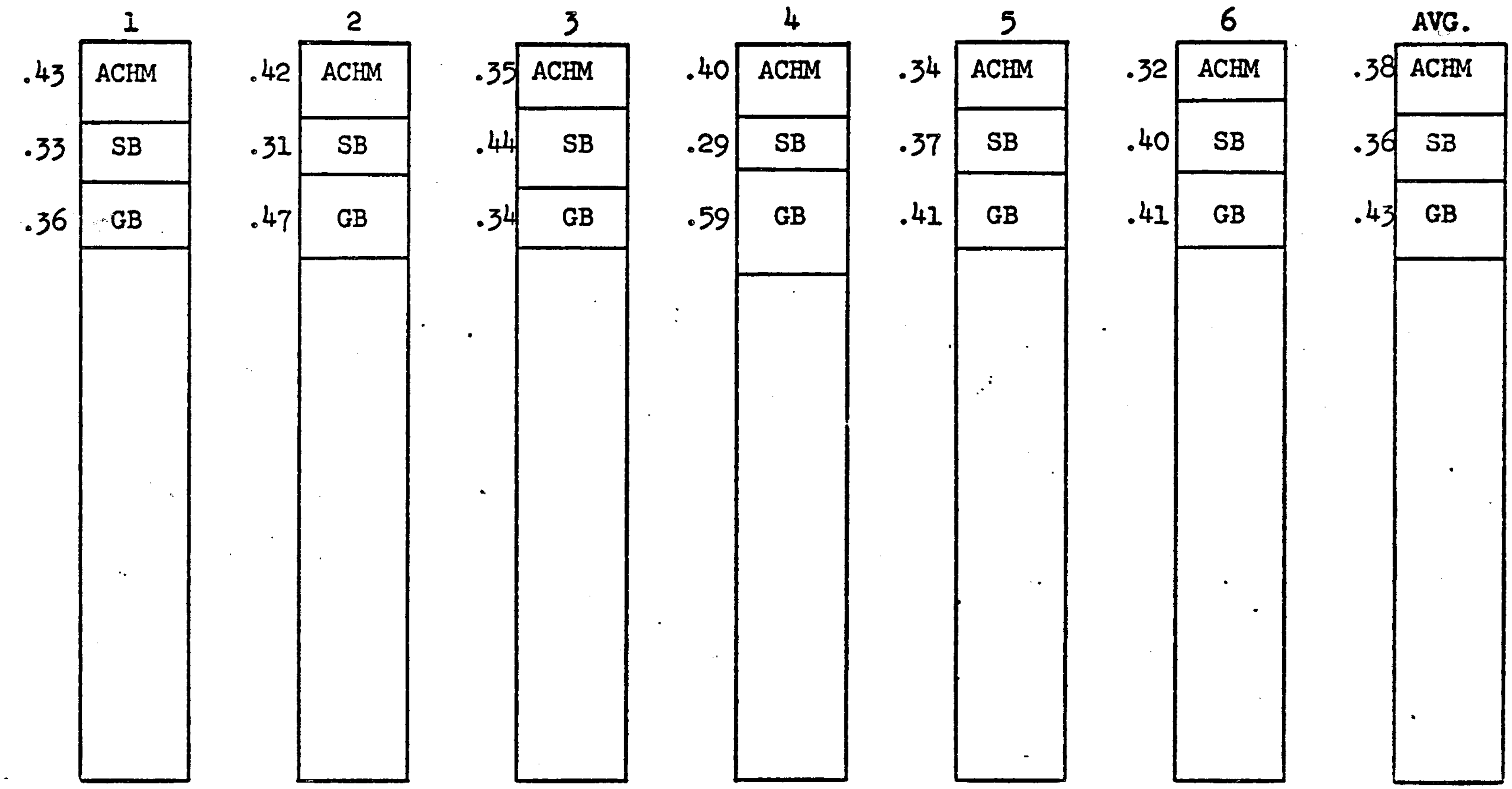
167-10-6


1
.30
ACHM
.15
DBST
.68
GB
2
.42
ACHM
.15
DBST
.39
GB
3
.39
ACHM
.08
DBST
.52
GB
4
.39
ACHM
.06
DBST
.52
GB
5
.33
ACHM
.12
DBST
.58
GB
6
.51
ACHM
.45
GB
AVG.
.39
ACHM
.09
DBST
.52
GB

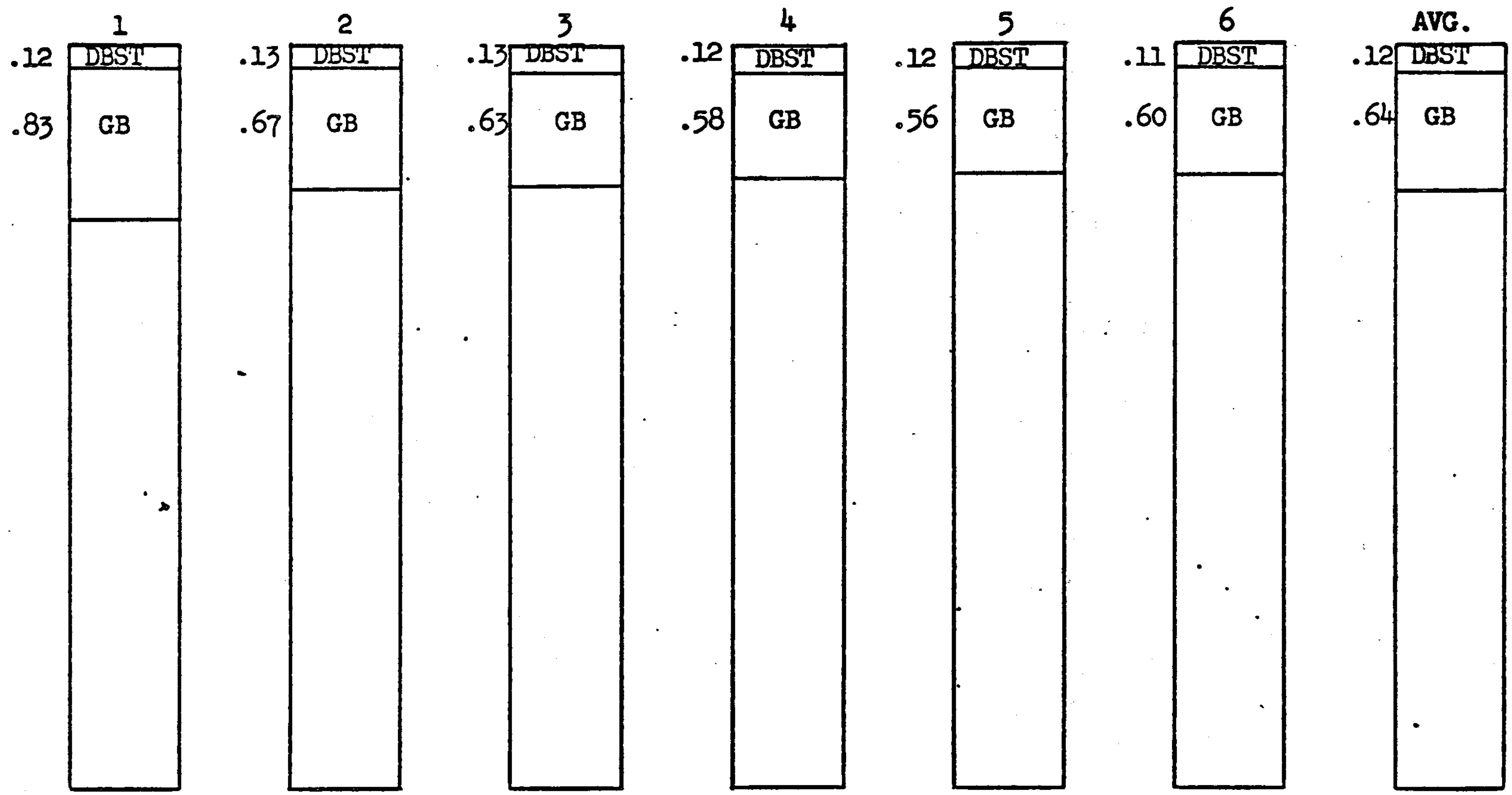
4-13-7


1
2
3
4
5
6
AVG.
ACHM
cold mix
CDMX
GB
.50
.50
.21
.39
.70
.30
.40
.59
.31
.55
.44
.19
.74
.39
.23
.80
.68
.56
.55
.21

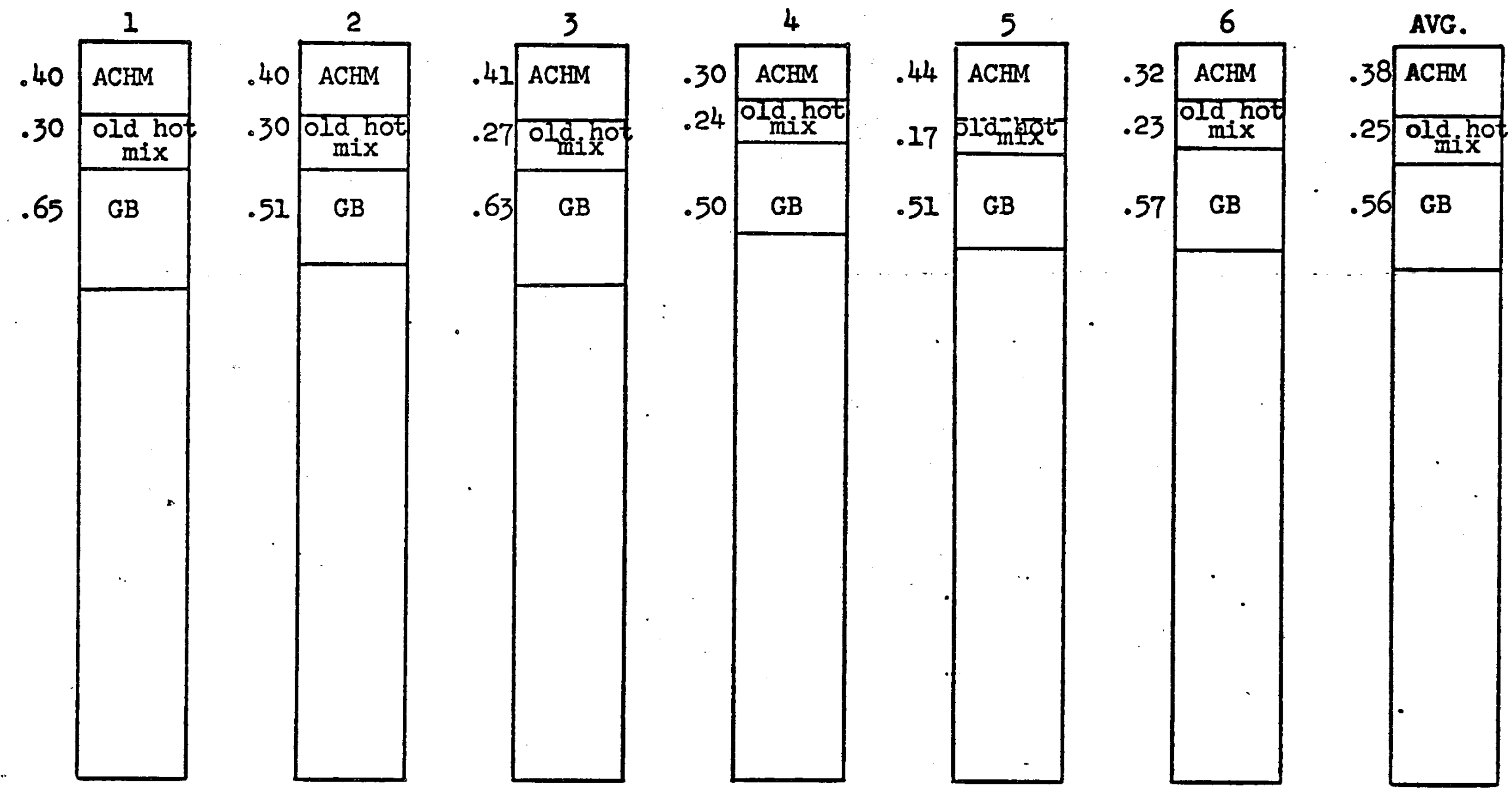
79-4-7


1
.43 ACHM
.33 SB
.36 GB
2
.42 ACHM
.31 SB
.47 GB
3
.35 ACHM
.44 SB
.34 GB
4
.40 ACHM
.29 SB
.59 GB
5
.34 ACHM
.37 SB
.41 GB
6
.32 ACHM
.40 SB
.41 GB
AVG.
.38 ACHM
.36 SB
.43 GB

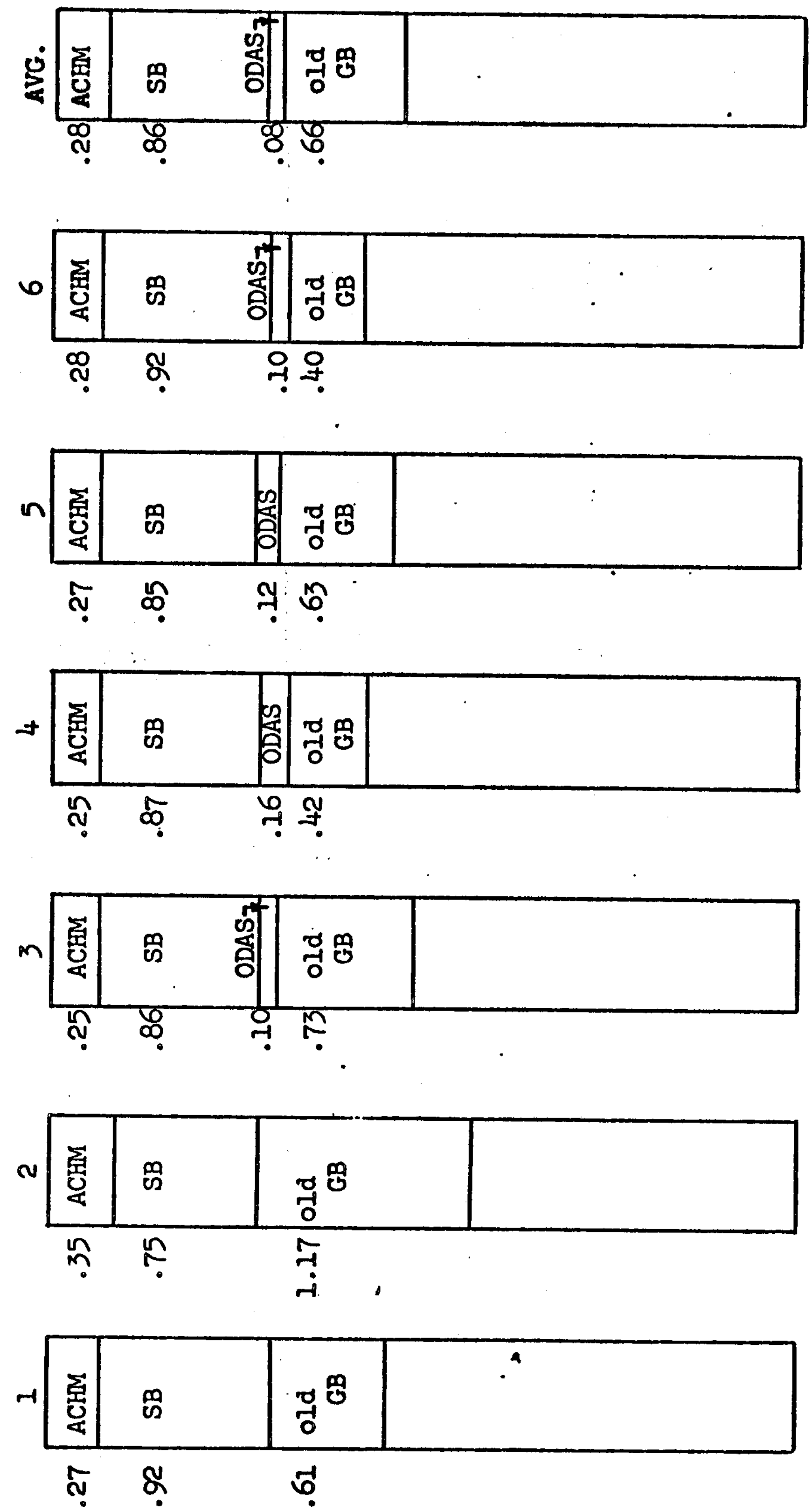
82-4-7


1
.12 DBST
.83 GB
2
.13 DBST
.67 GB
3
.13 DBST
.63 GB
4
.12 DBST
.58 GB
5
.12 DBST
.56 GB
6
.11 DBST
.60 GB
AVG.
.12 DBST
.64 GB

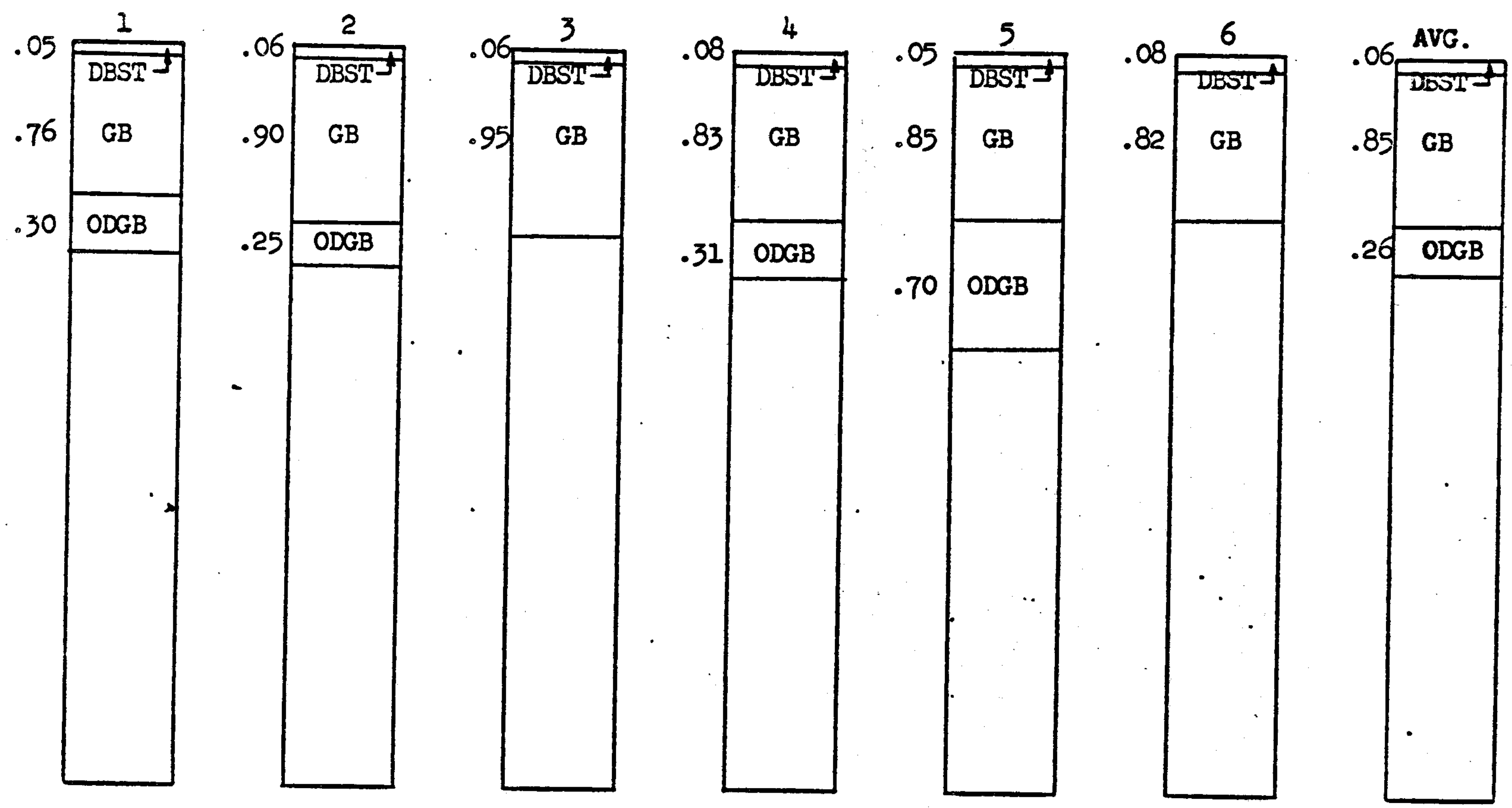
132-1-7


1
.40 ACHM
.30 old hot mix
.65 GB
2
.40 ACHM
.30 old hot mix
.51 GB
3
.41 ACHM
.27 old hot mix
.63 GB
4
.30 ACHM
.24 old hot mix
.50 GB
5
.44 ACHM
.17 old hot mix
.51 GB
6
.32 ACHM
.23 old hot mix
.57 GB
AVG.
.38 ACHM
.25 old hot mix
.56 GB

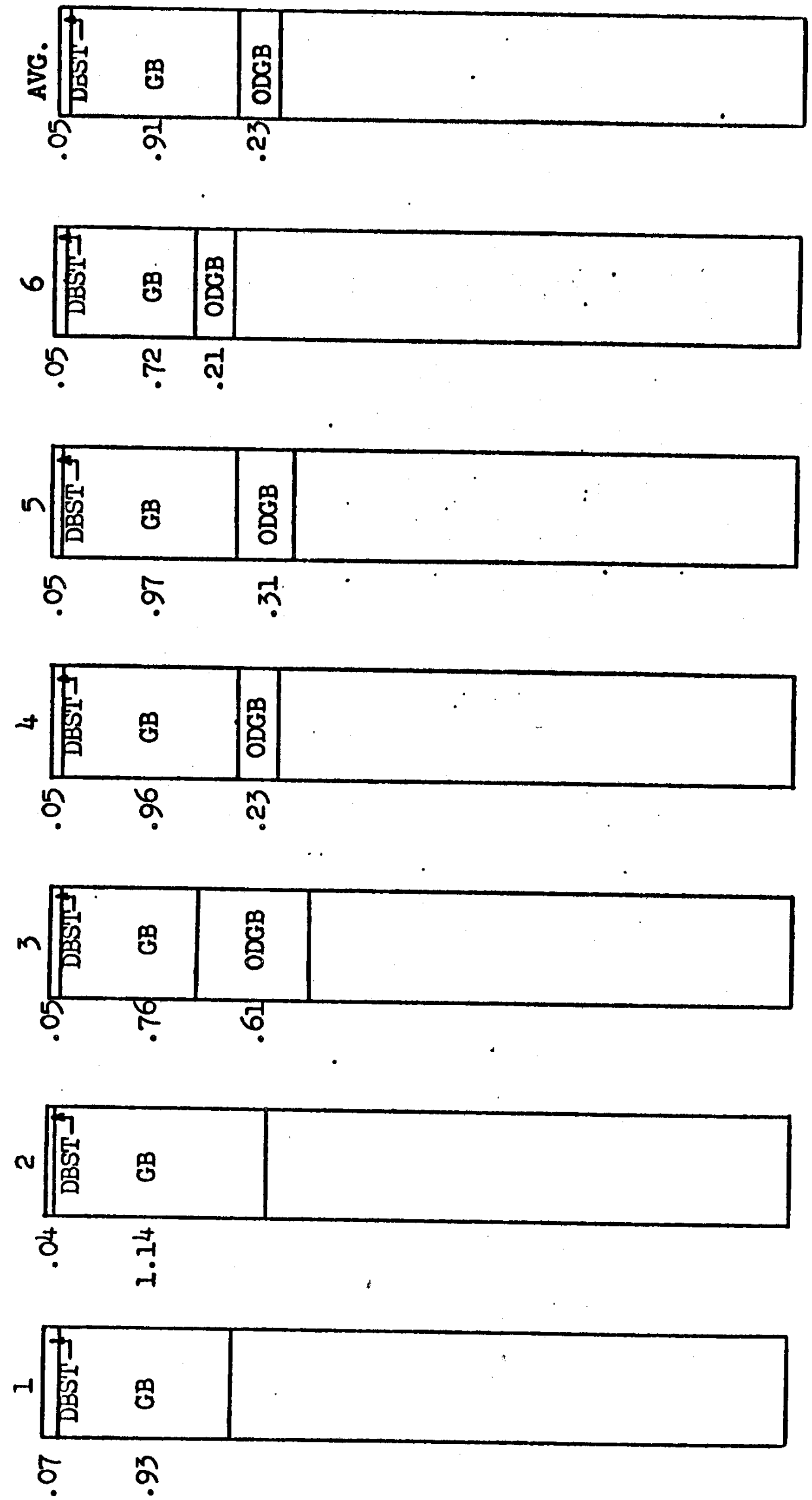
63-3-10


AVG. ACHM SB ODAS? old GB
.28 .86 .08 .66
6 ACHM SB ODAS? old GB
.28 .92 .10 .40
5 ACHM SB ODAS old GB
.27 .85 .12 .63
4 ACHM SB ODAS old GB
.25 .87 .16 .42
3 ACHM SB ODAS? old GB
.25 .86 .10 .73
2 ACHM SB old GB
.35 .75 1.17
1 ACHM SB old GB
.27 .92 .61

S63-6-10


1
.05
DBST
.76
GB
.30
ODGB
2
.06
DBST
.90
GB
.25
ODGB
3
.06
DBST
.95
GB
4
.08
DBST
.83
GB
.31
ODGB
5
.05
DBST
.85
GB
.70
ODGB
6
.08
DBST
.82
GB
AVG.
.06
DBST
.85
GB
.26
ODGB

118-2-10



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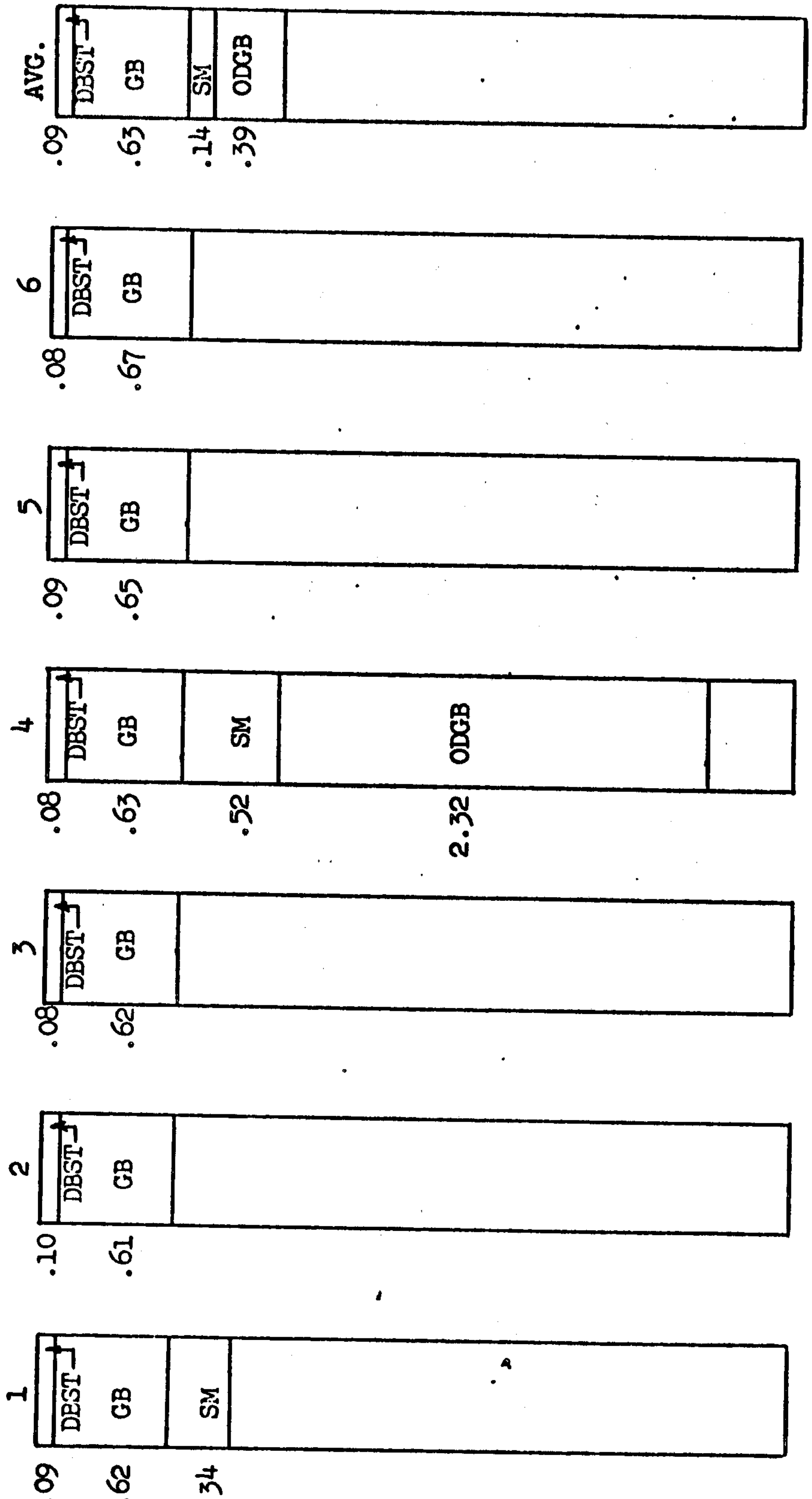
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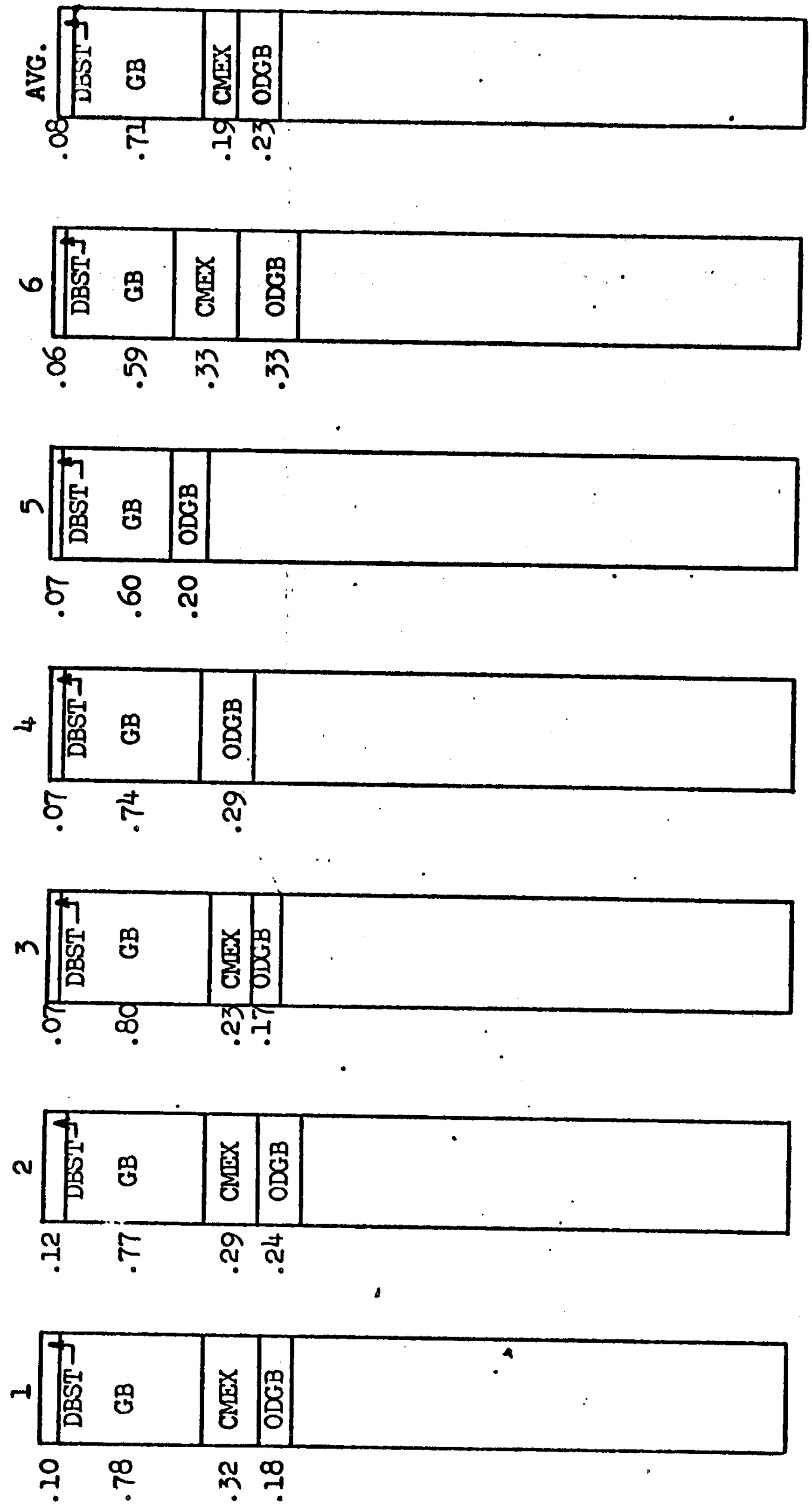
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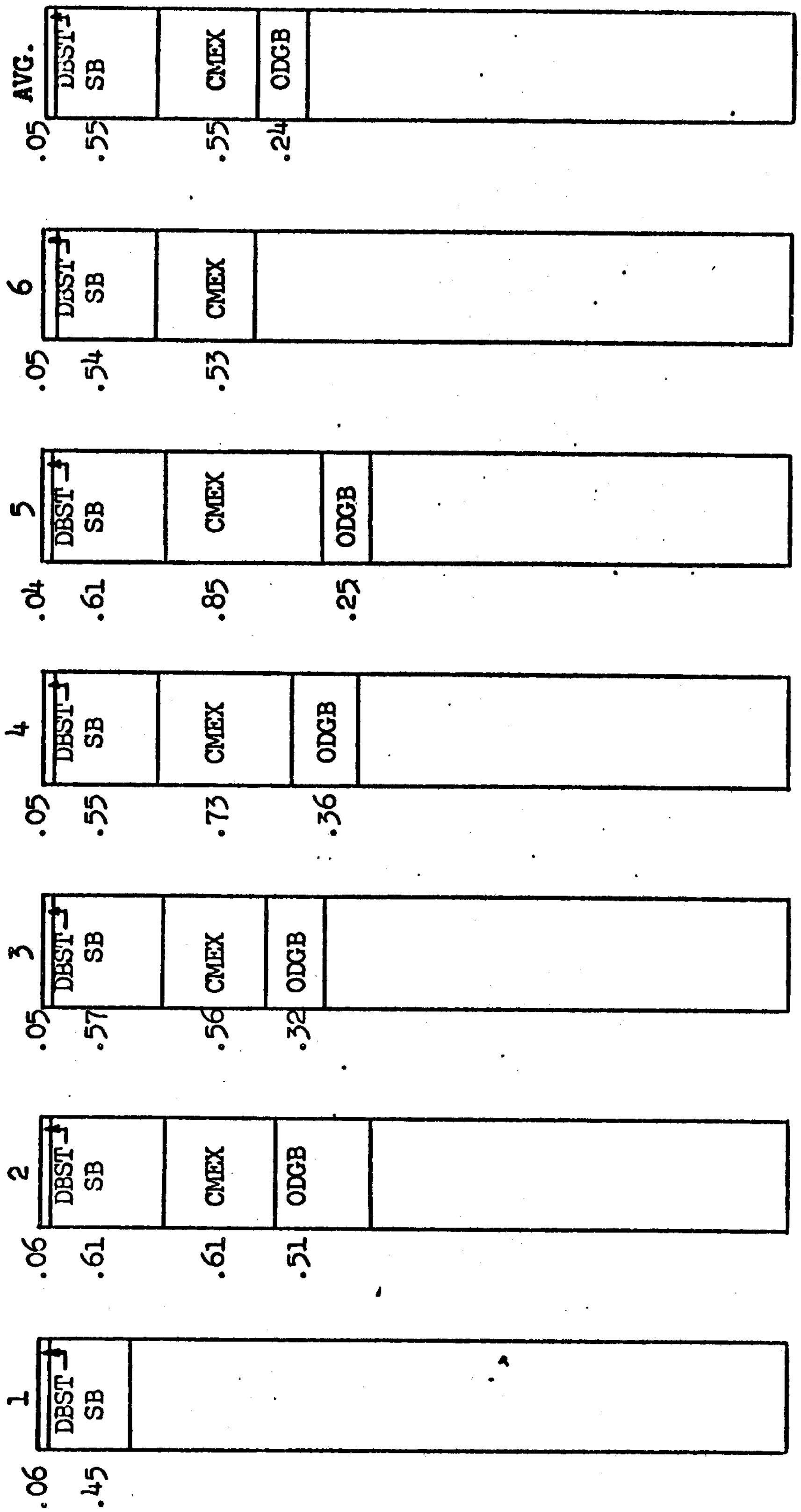

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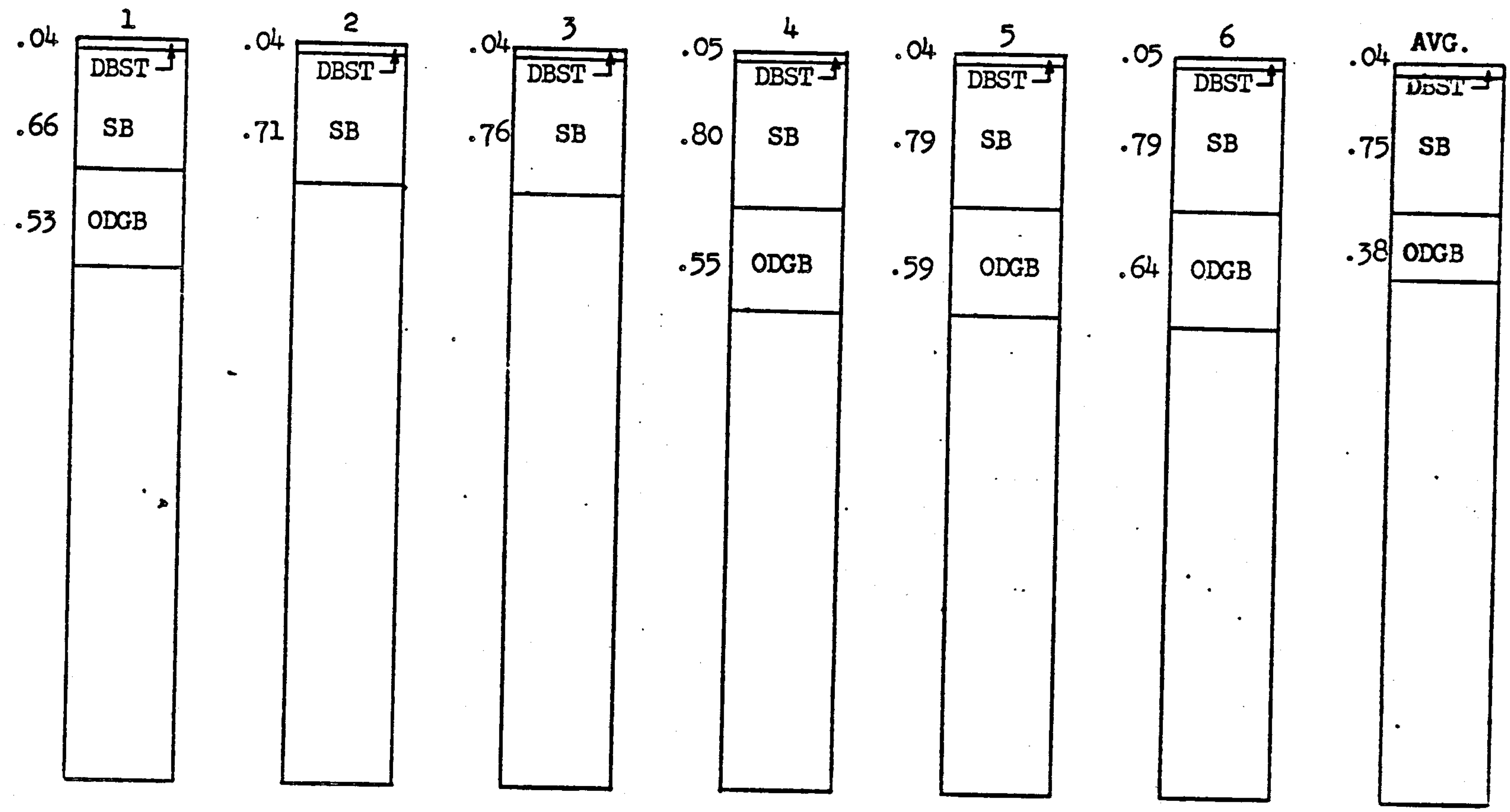
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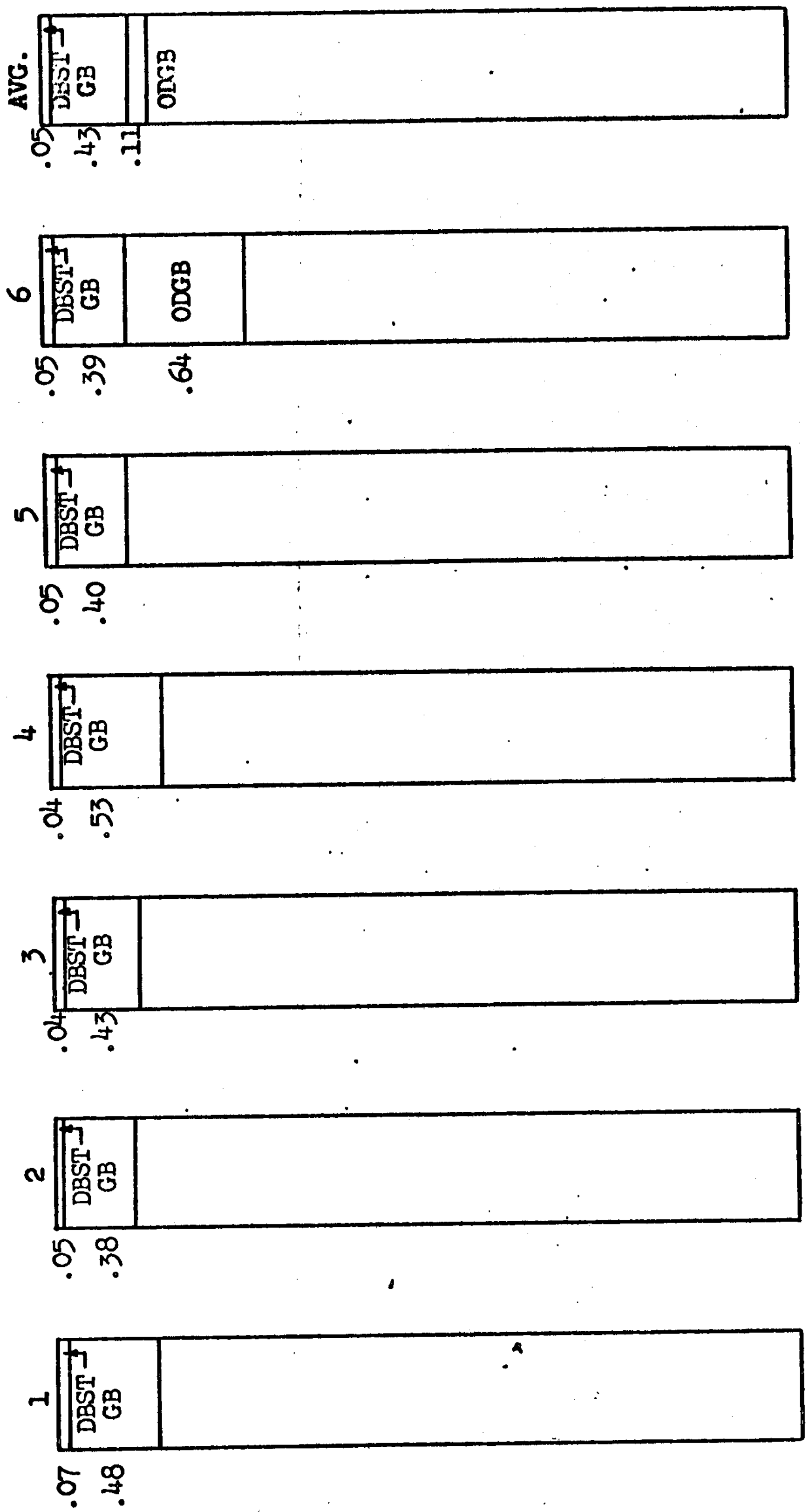
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312-1-10

APPENDIX C

Traffic studies of vehicle count and load classification were compiled by the Traffic Section of the Arkansas Highway Department Planning and Research Division. The information for each test section was either from direct studies or implied from studies of similar highways.

The summation of the equivalent 18-kip axle loads was calculated from the time of construction or the time period since the last resurfacing of the test site. The percentage of vehicles in each axle weight group, average daily traffic (ADT), time period, and equivalency factors were combined to indicate the total applied 18-kip axle loads (Refer to Table IV).

Axle Weight	Number of Vehicles (ADT x percent)		Equivalency Factor		Equivalent 18-Kip Loads
Single Axle					
Under 3000	------	X	0.0002	=	------
3000 - 6999	------	X	0.0065	=	------
7000 - 7999	------	X	0.0325	=	------
8000 - 11999	------	X	0.1000	=	------
12000 - 15999	------	X	0.39	=	------
16000 - 17999	------	X	0.825	=	------
18000 - 19999	------	X	1.245	=	------
20000 - 21999	------	X	1.78	=	------
22000 - 23999	------	X	2.49	=	------
24000 - 25999	------	X	3.40	=	------
Tandem Axle					
Under 6000	------	X	0.01	=	------
6000 - 11999	------	X	0.01	=	------
12000 - 17999	------	X	0.045	=	------
18000 - 23999	------	X	0.185	=	------
24000 - 29999	------	X	0.465	=	------
30000 - 31999	------	X	0.795	=	------
32000 - 33999	------	X	1.00	=	------
34000 - 35999	------	X	1.245	=	------
36000 - 37999	------	X	1.53	=	------
38000 - 39999	------	X	1.855	=	------
Passenger Cars	------	X	0.0002	=	------

TABLE IV

EQUIVALENT LOADS

The following columns present the summation of axle loads and the time period of accumulation.

Section	Total Equivalent Load Applications	Time (Months)
1-7-1	53854	79
49-1-1	100712	79
64-17-1	583575	78
8-14-2	212375	84
79-7-2	861068	120
79-10-2	905495	83
41-3-3	179120	82
70-5-3	233263	60
71-2-3	1345714	71
71-5-3	673160	44
82-1-3	1921140	245
13-10-6	43506	59
70-10-6	726680	103
167-10-6	461349	55
4-13-7	484014	217
79-4-7	779813	60
82-4-7	2227954	203
132-1-7	823572	235
63-3-10	1055619	143
S63-6-10	1055993	68
118-2-10	178198	55
136-0-10	77587	71
139-2-10	33575	47
139-5-10	35068	56
228-1-10	36649	71
304-1-10	10576	35
312-1-10	77541	46

THE UNIVERSITY OF ARKANSAS

CIVIL ENGINEERING DEPARTMENT

UNIVERSITY OF ARKANSAS
VERITATE DUCE PROGREDI
1871

Field and Laboratory Data Summary

Highway Research Project No. 20

Adaptation of The General AASHO Road Test Equation To Arkansas Conditions

Volume II

Interim Technical Report No. 5

THE ARKANSAS STATE HIGHWAY DEPARTMENT

PLANNING AND RESEARCH DIVISION

In Cooperation With

THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, BUREAU OF PUBLIC ROADS

August 1970

FIELD AND LABORATORY
DATA SUMMARY

BY

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and

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Co-Principal Investigator

and

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INTERIM TECHNICAL REPORT NO. 5

of

HIGHWAY RESEARCH PROJECT NO. 20

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Federal Highway Administration
Bureau of Public Roads

August 1970

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PART III - APPENDIX

Appendix - A

SUBGRADE AND BASE CHARACTERISTICS - CALIFORNIA R-VALUE

In Appendix - A, the R-values for each sample taken in Phase I, II, and III of Highway Research Project No. 20 are shown. A graph of the R-values versus the exudation pressure is used to determine the modified R-values. For each sample, the sample number, the date the sample was tested, a visual description of the sample, modified R-values at exudation pressures of 240 PSI and 300 PSI, and the R-value-exudation pressure graph are shown. All samples are listed in numerical order according to sample numbers. Table A-1 is an example of how R-values are presented in Appendix - A:

Sample No.:	2
Date Tested:	7-27-65
Visual Description:	Sand
R-Value at 240 PSI:	65
R-Value at 300 PSI:	65

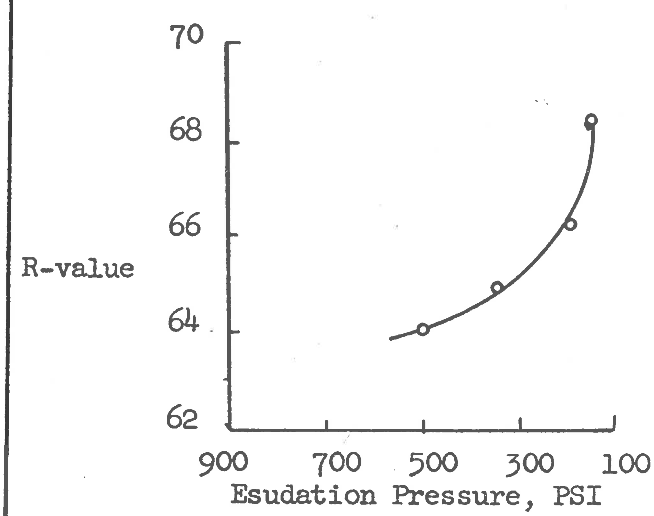
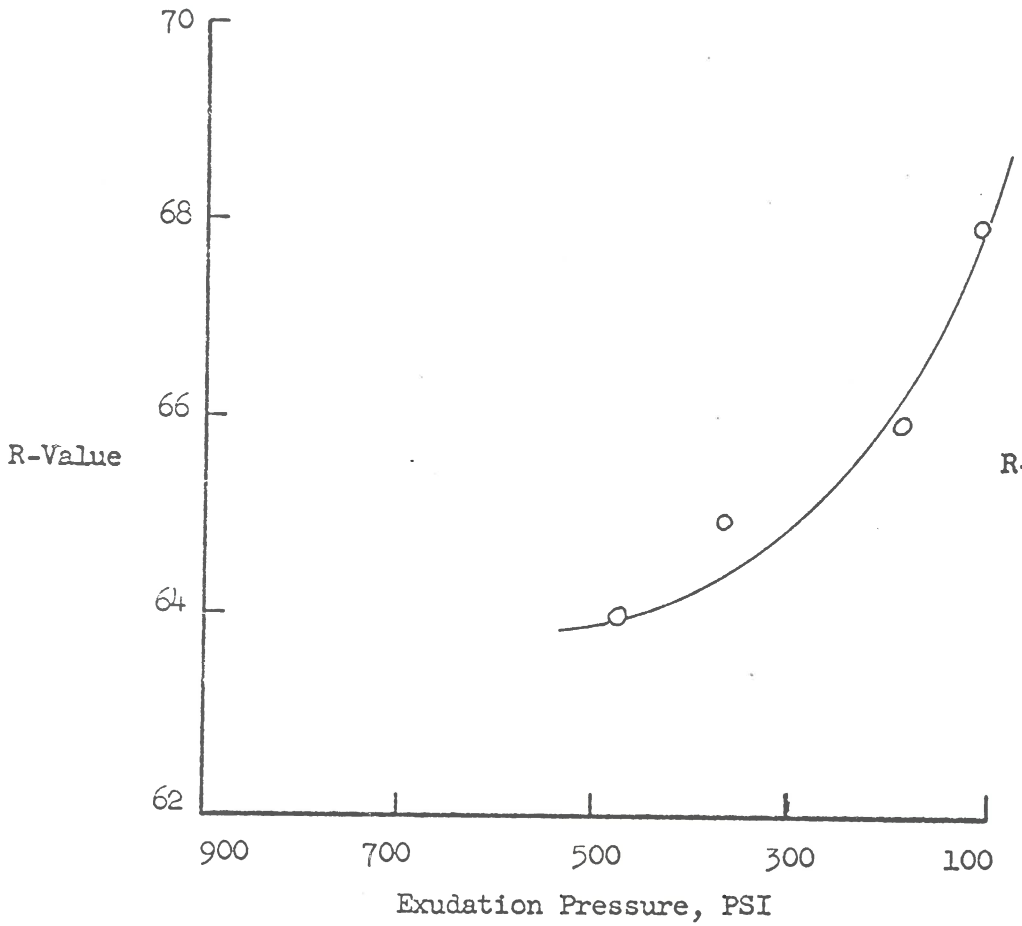


Table A-1

Summary of Data
California R-Value

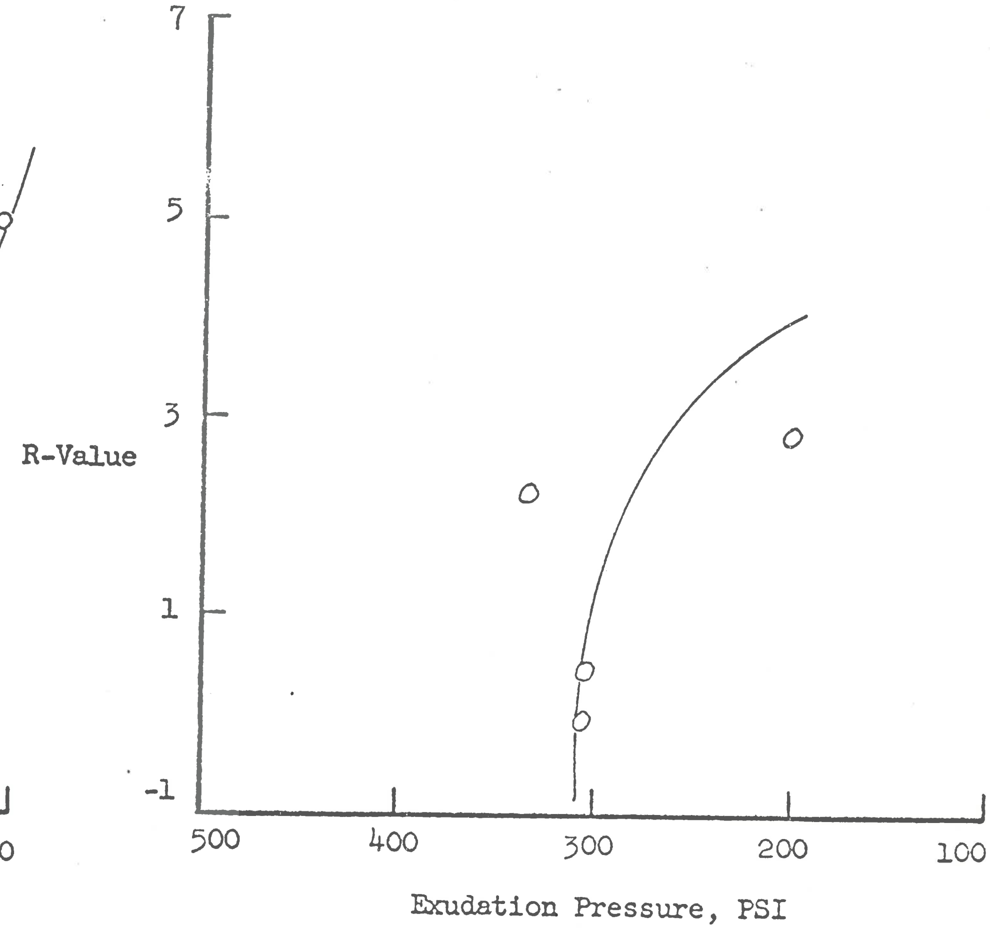
Sample No.: 2
Date Tested: 7-27-65
Visual Description: Sand

R-Value at 240 PSI: 65
R-Value at 300 PSI: 65



Sample No.: 3
Date Tested: 7-27-67
Visual Description: Clayey Silt

R-Value at 240 PSI: 03
R-Value at 300 PSI: 02



Summary of Data
California R-Value

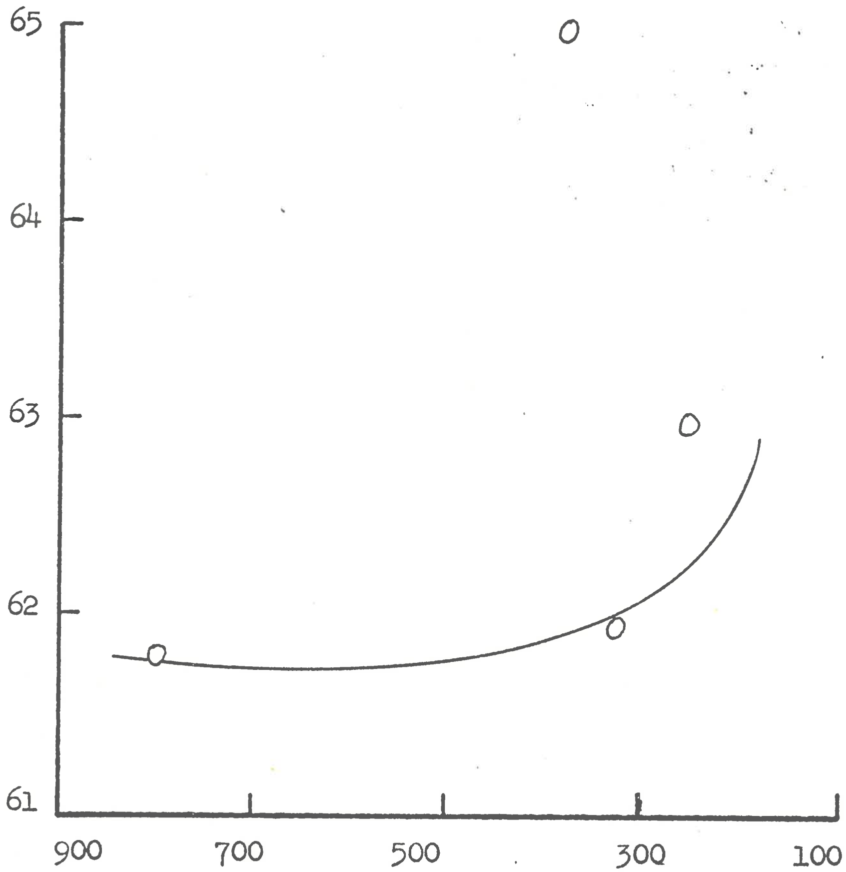
Sample No.: 4
Date Tested: 8-5-65
Visual Description: Tan Sand

R-Value at 240 PSI: 63
R-Value at 300 PSI: 62

Sample No.: 5
Date Tested: 8-16-65
Visual Description: Tan Clay

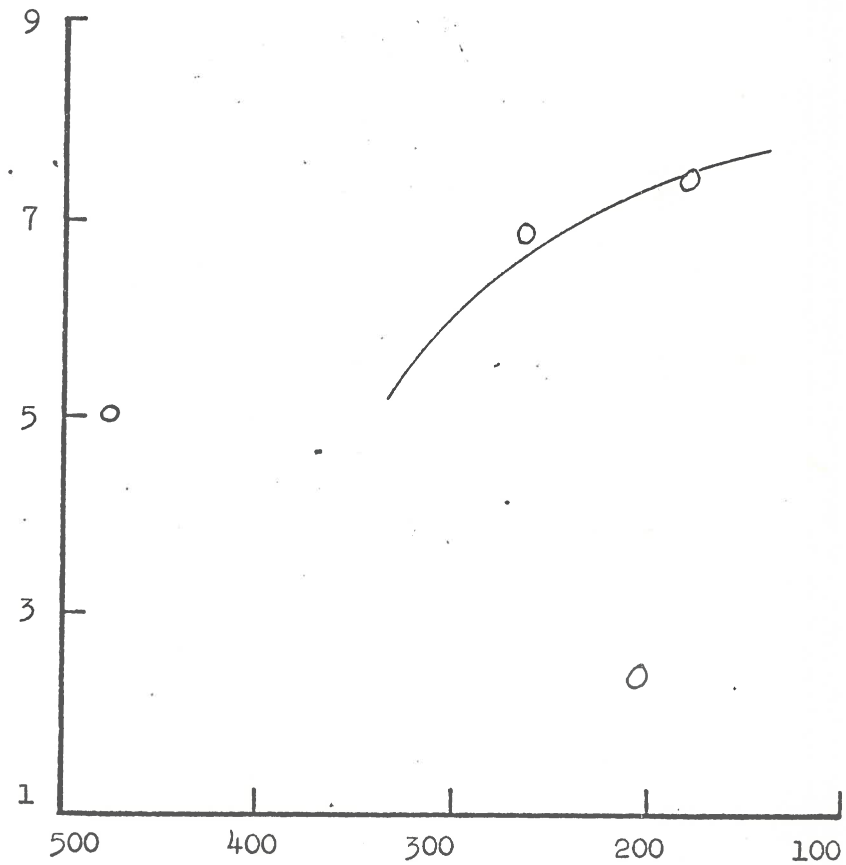
R-Value at 240 PSI: 07
R-Value at 300 PSI: 06

R-Value



Exudation Pressure, PSI

R-Value

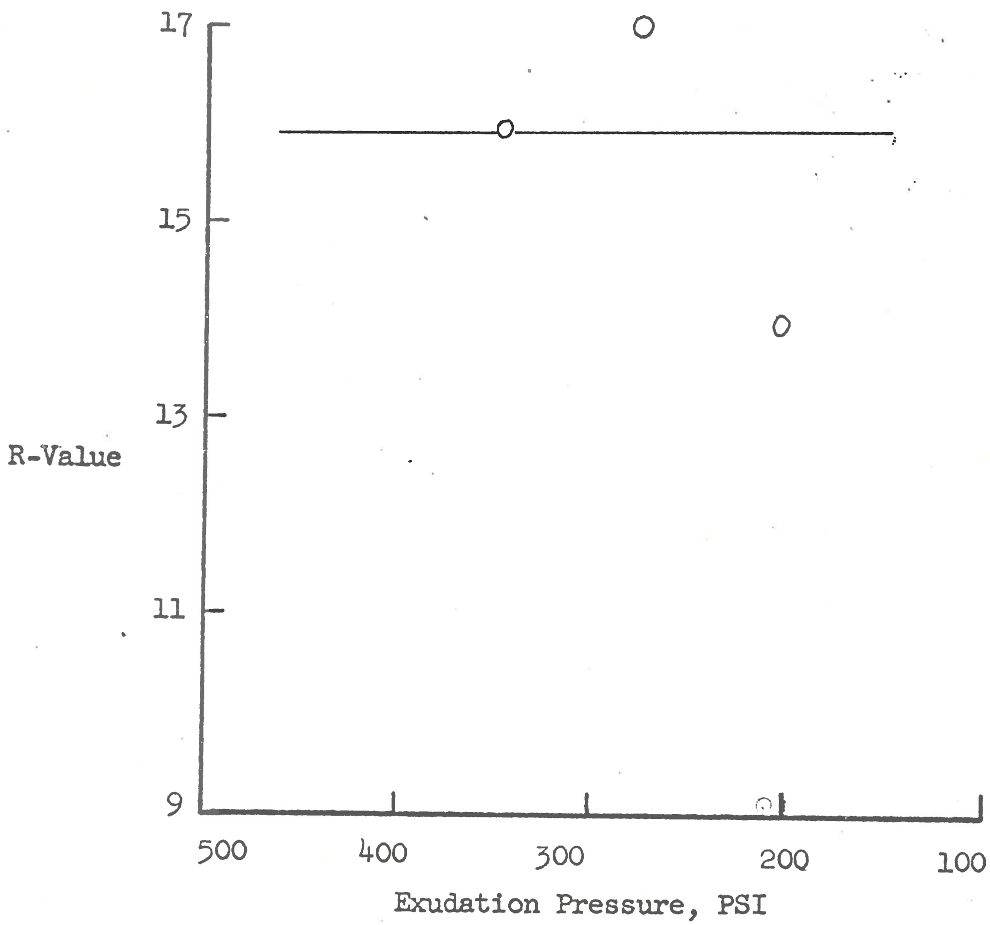


Exudation Pressure, PSI

Summary of Data
California R-Value

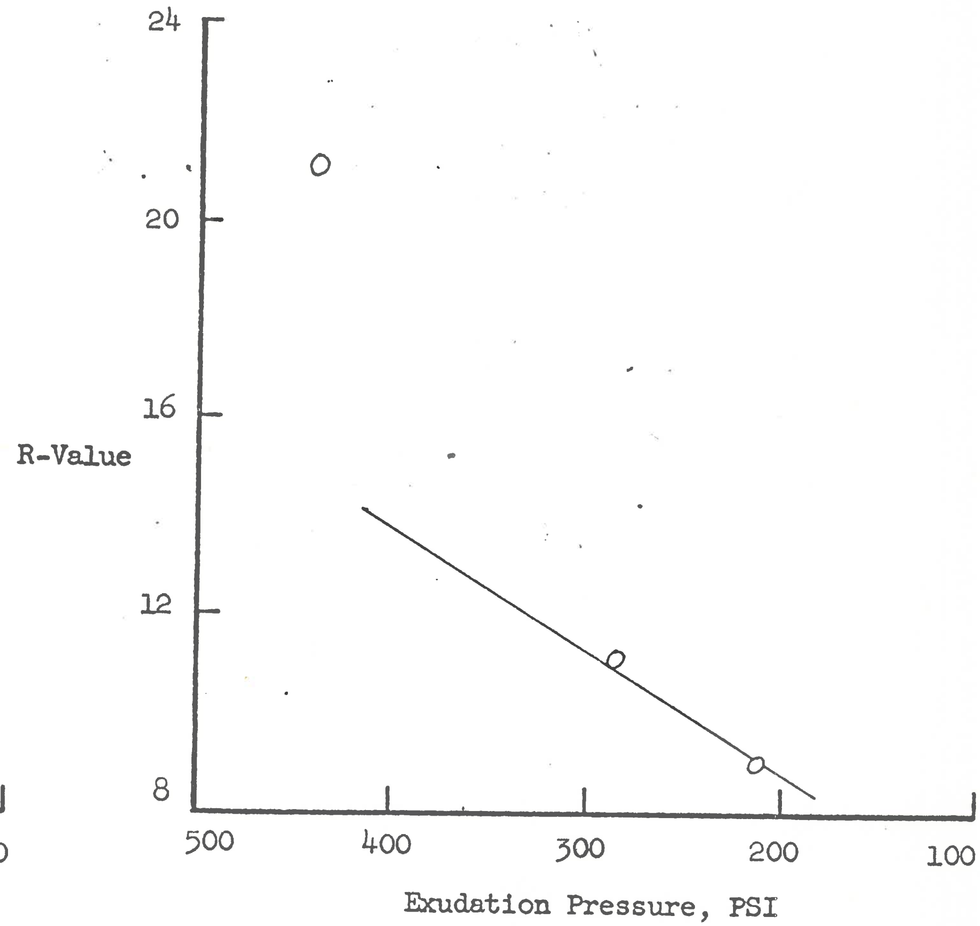
Sample No.: 6
Date Tested: 8-17-65
Visual Description: Red Sand

R-Value at 240 PSI: 16
R-Value at 300 PSI: 16



Sample No.: 7
Date Tested: 8-17-65
Visual Description: Tan Sandy Clay

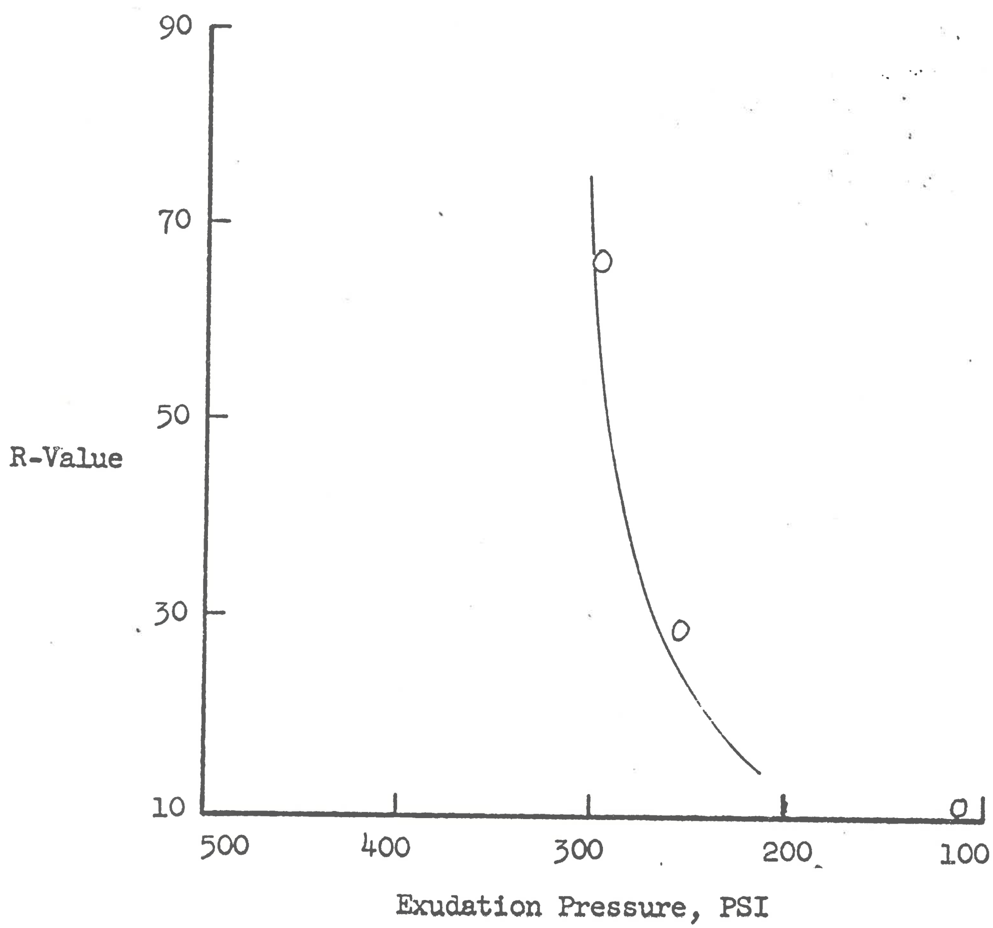
R-Value at 240 PSI: 09
R-Value at 300 PSI: 10



Summary of Data
California R-Value

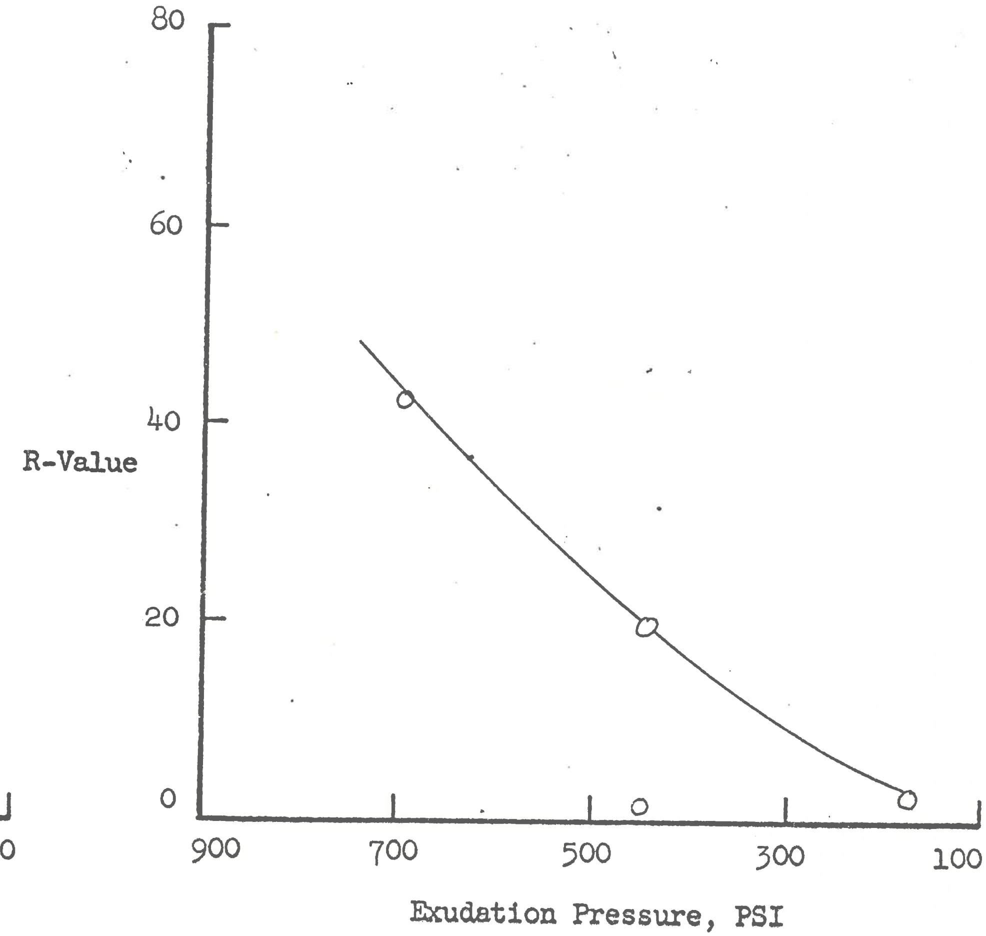
Sample No.: 8
Date Tested: 8-18-65
Visual Description: Tan Clayey Sand

R-Value at 240 PSI: 20
R-Value at 300 PSI: 30



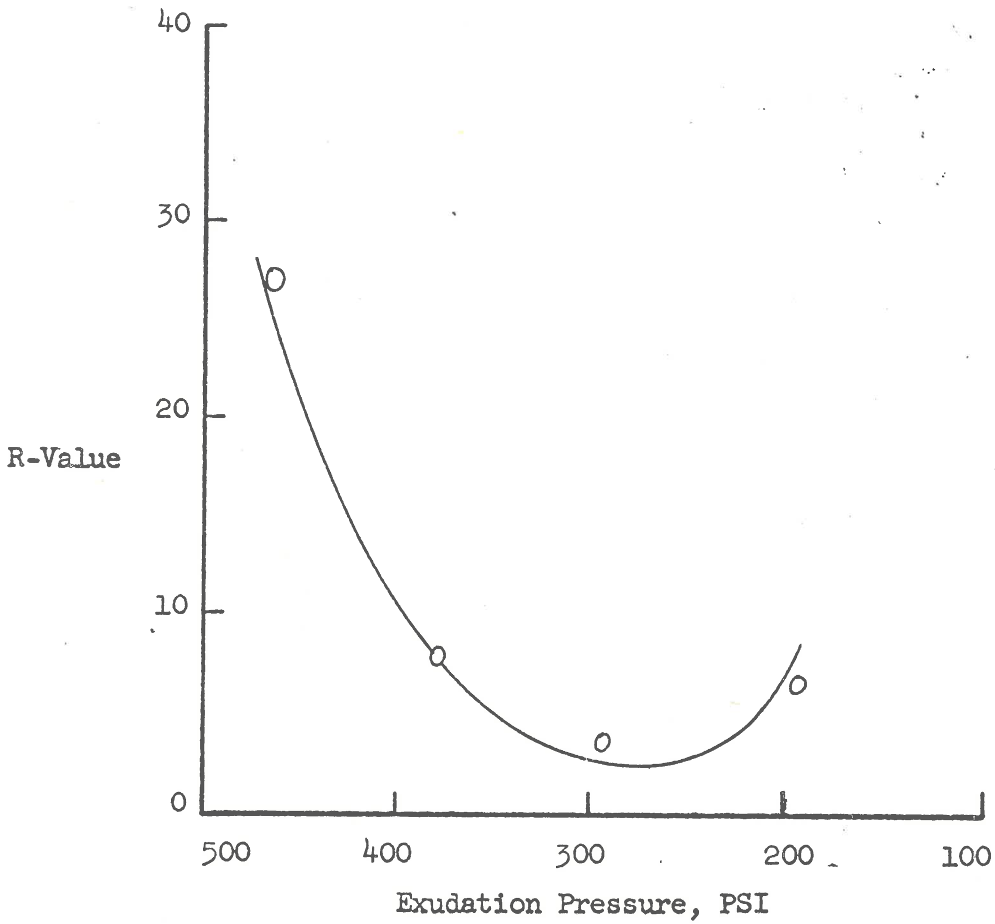
Sample No.: 9
Date Tested: 8-18-65
Visual Description: Slightly Sandy Clay

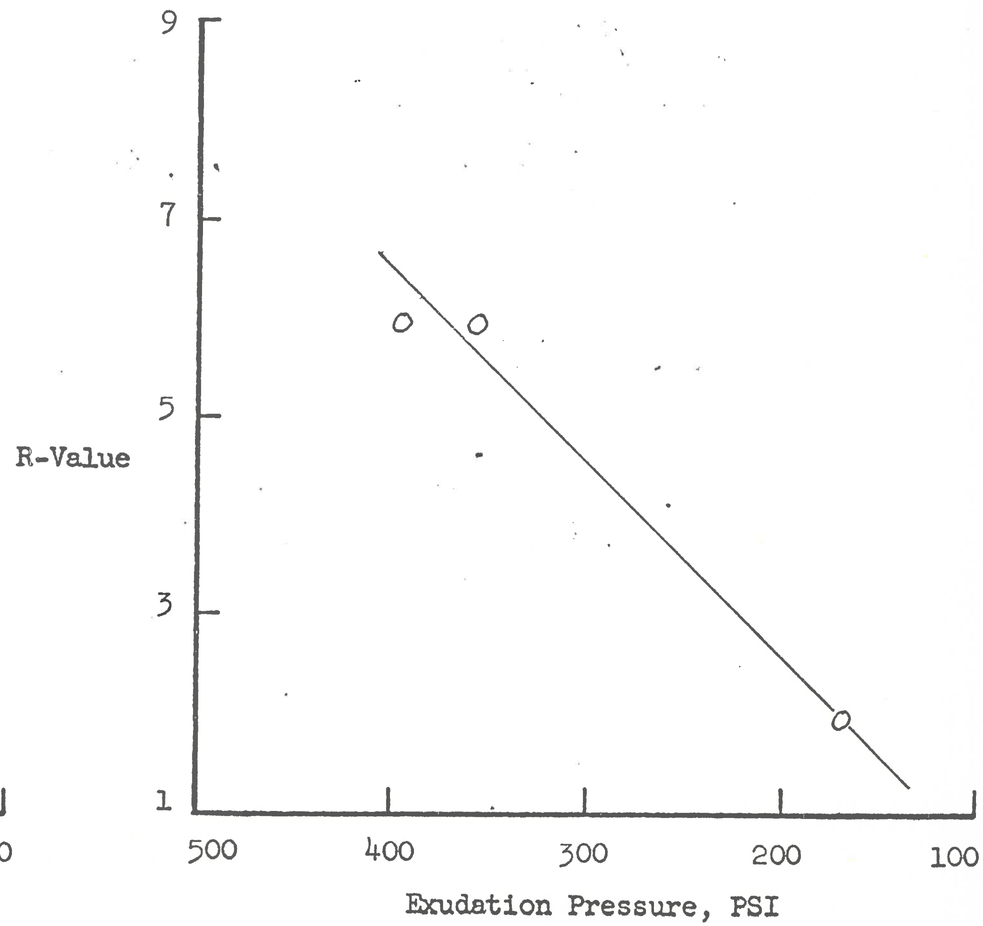
R-Value at 240 PSI: 08
R-Value at 300 PSI: 11



Summary of Data
California R-Value

Sample No.:	10	Sample No.:	11
Date Tested:	8-18-65	Date Tested:	8-25-65
Visual Description:	Brownish Tan Clay	Visual Description:	Tan Clay with Trace of Silt
R-Value at 240 PSI:	03	R-Value at 240 PSI:	03
R-Value at 300 PSI:	02	R-Value at 300 PSI:	05

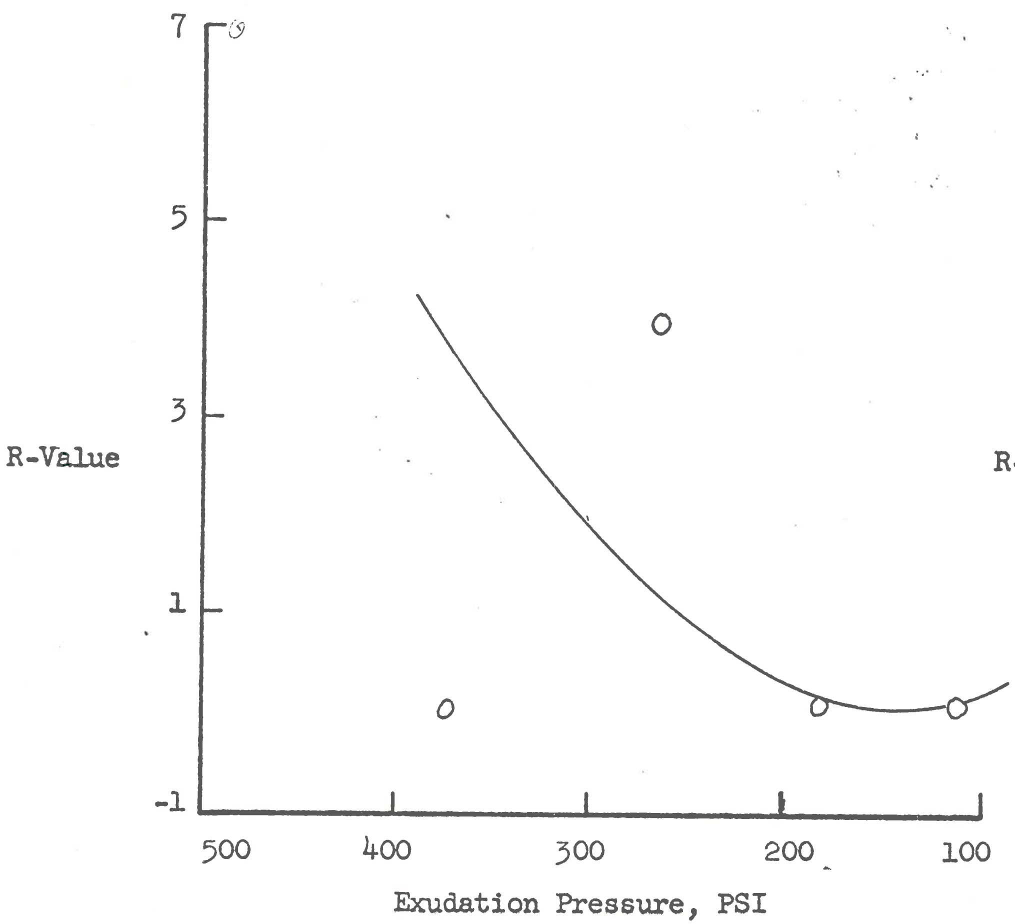




Summary of Data
California R-Value

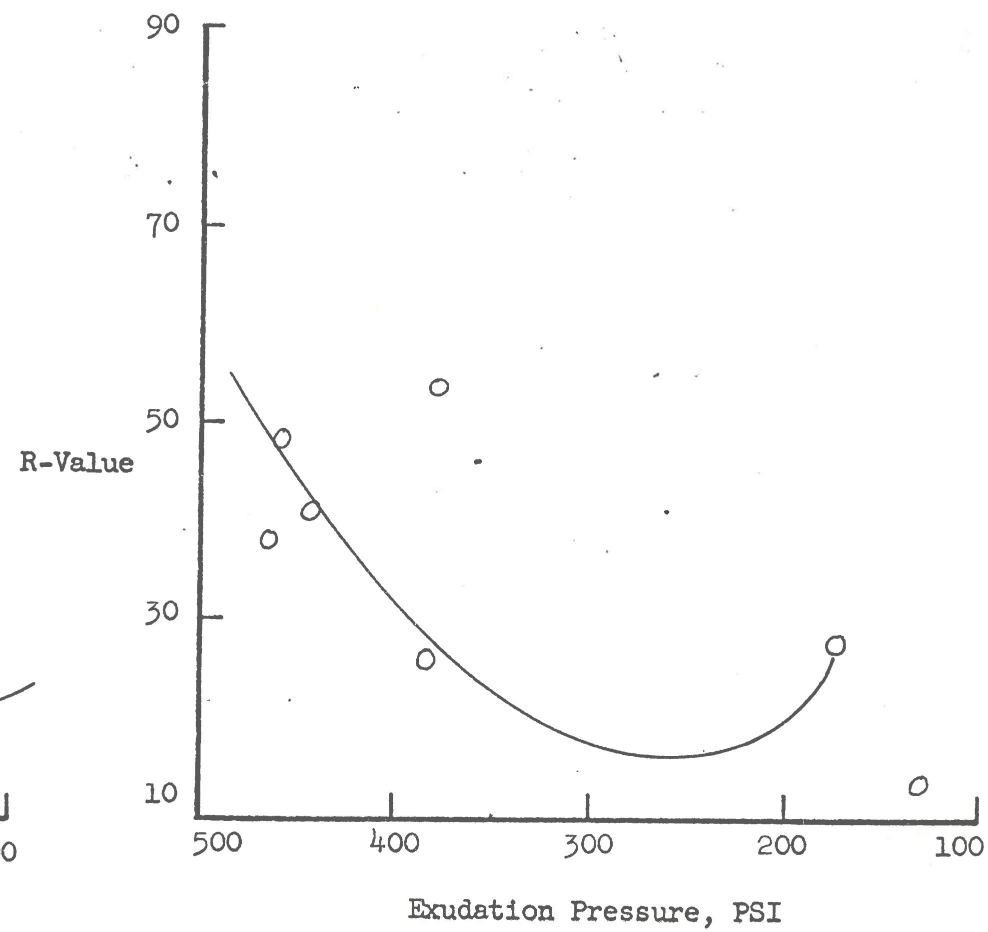
Sample No.: 12
Date Tested: 8-18-65
Visual Description: Red Silty Clay

R-Value at 240 PSI: 01
R-Value at 300 PSI: 02



Sample No.: 13
Date Tested: 8-18-65
Visual Description: Brown Clay-Silt

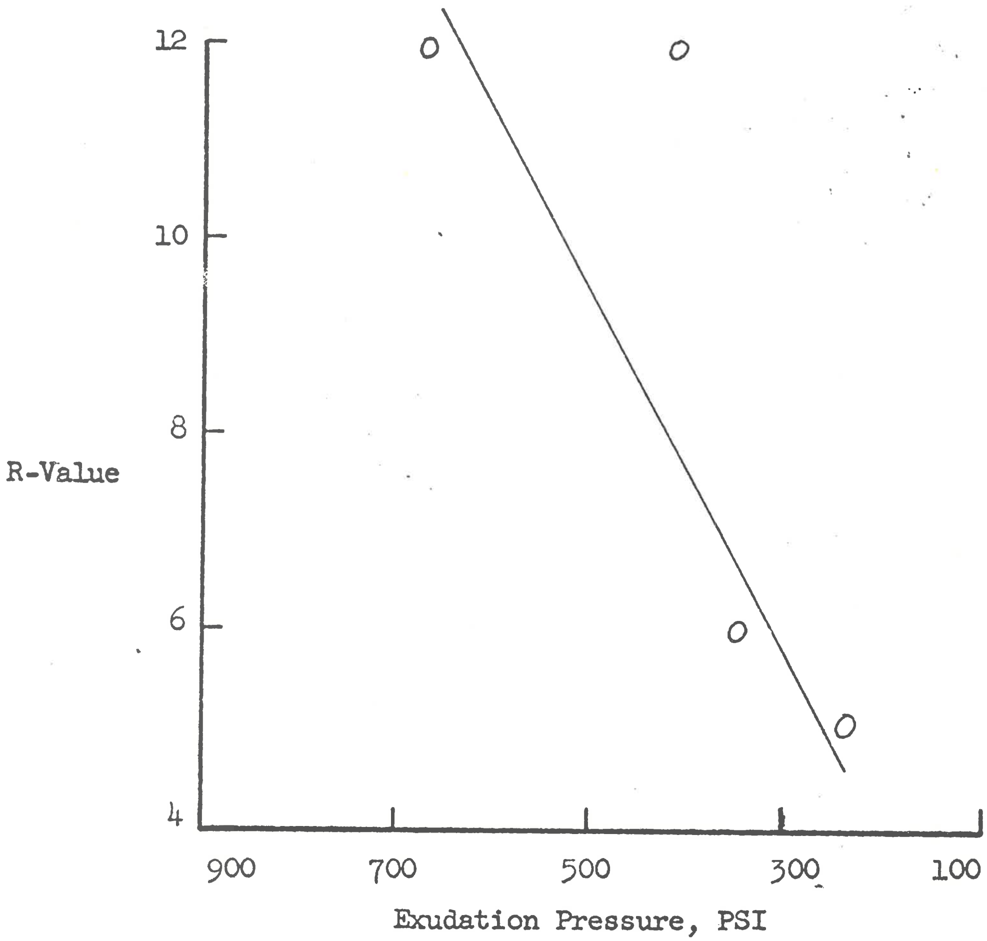
R-Value at 240 PSI: 17
R-Value at 300 PSI: 20



Summary of Data
California R-Value

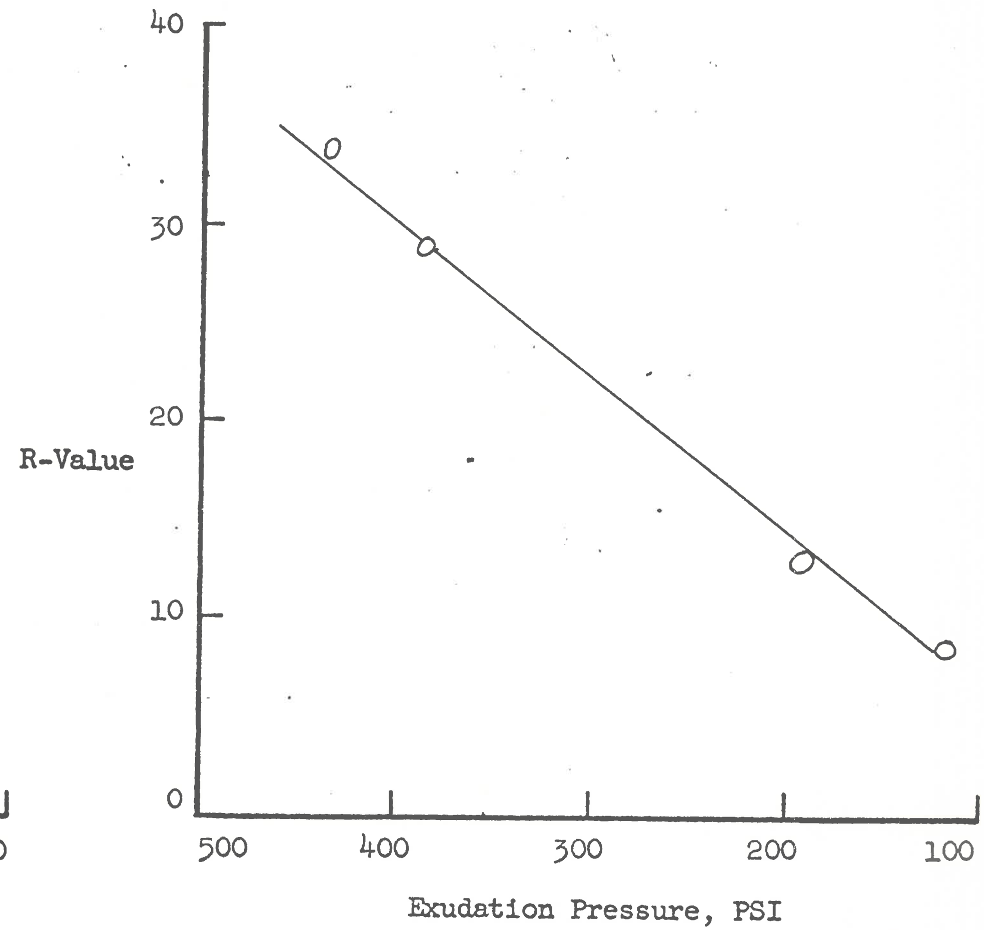
Sample No.: 14
Date Tested: 8-20-65
Visual Description: Grayish Clay

R-Value at 240 PSI: 05
R-Value at 300 PSI: 06



Sample No.: 15
Date Tested: 8-24-65
Visual Description: Red Clayey Sand

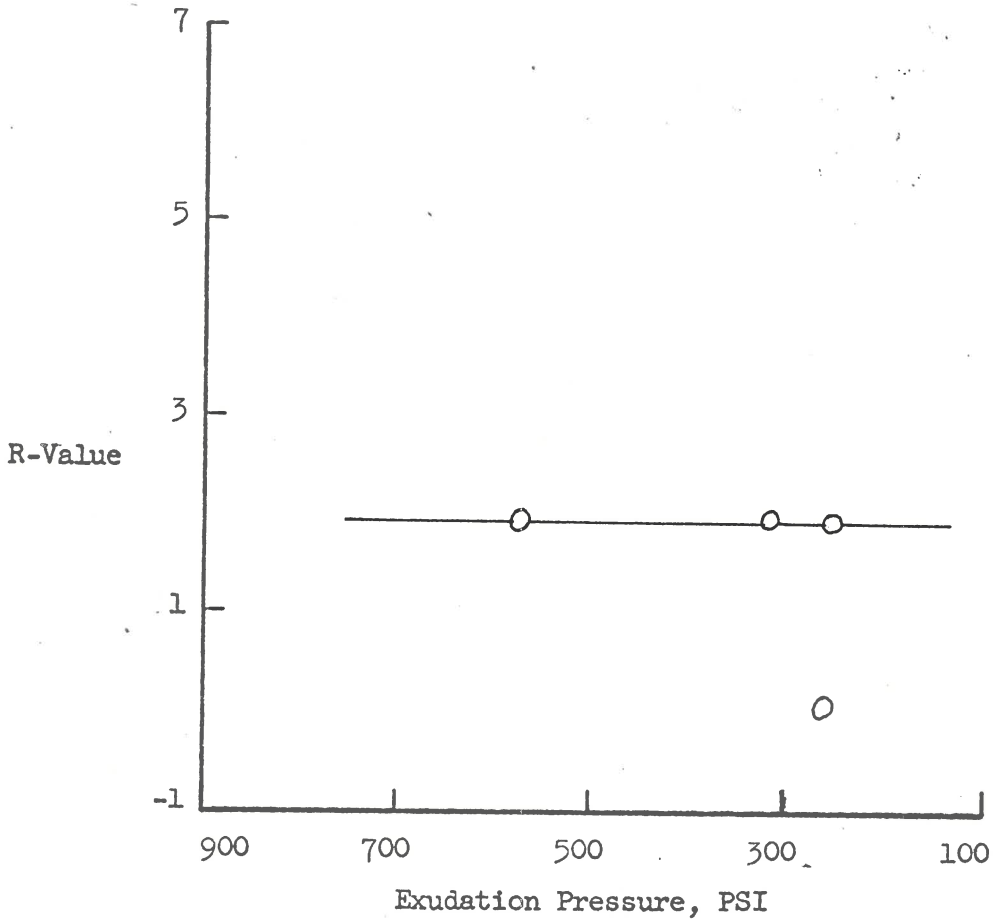
R-Value at 240 PSI: 18
R-Value at 300 PSI: 22



Summary of Data
California R-Value

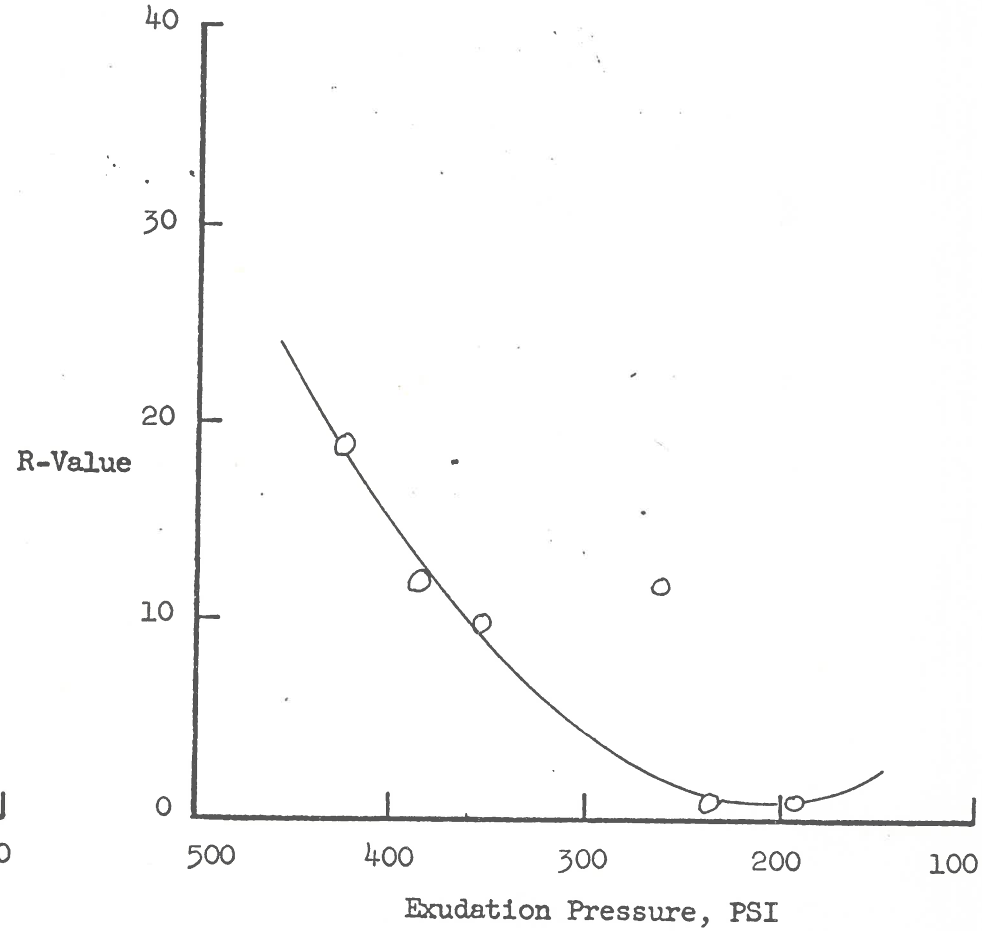
Sample No.: 16
Date Tested: 8-26-65
Visual Description: Tannish Brown Sandy Clay

R-Value at 240 PSI: 02
R-Value at 300 PSI: 02



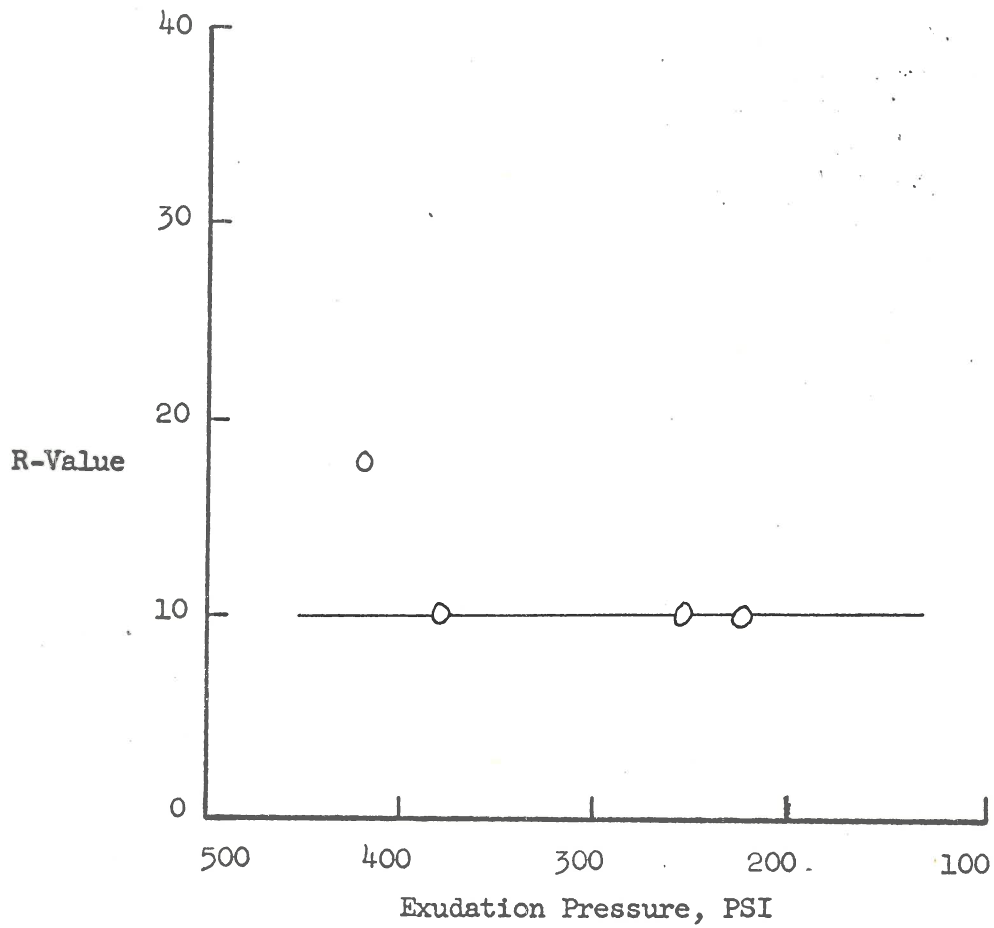
Sample No.: 17
Date Tested: 9-1-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 01
R-Value at 300 PSI: 05

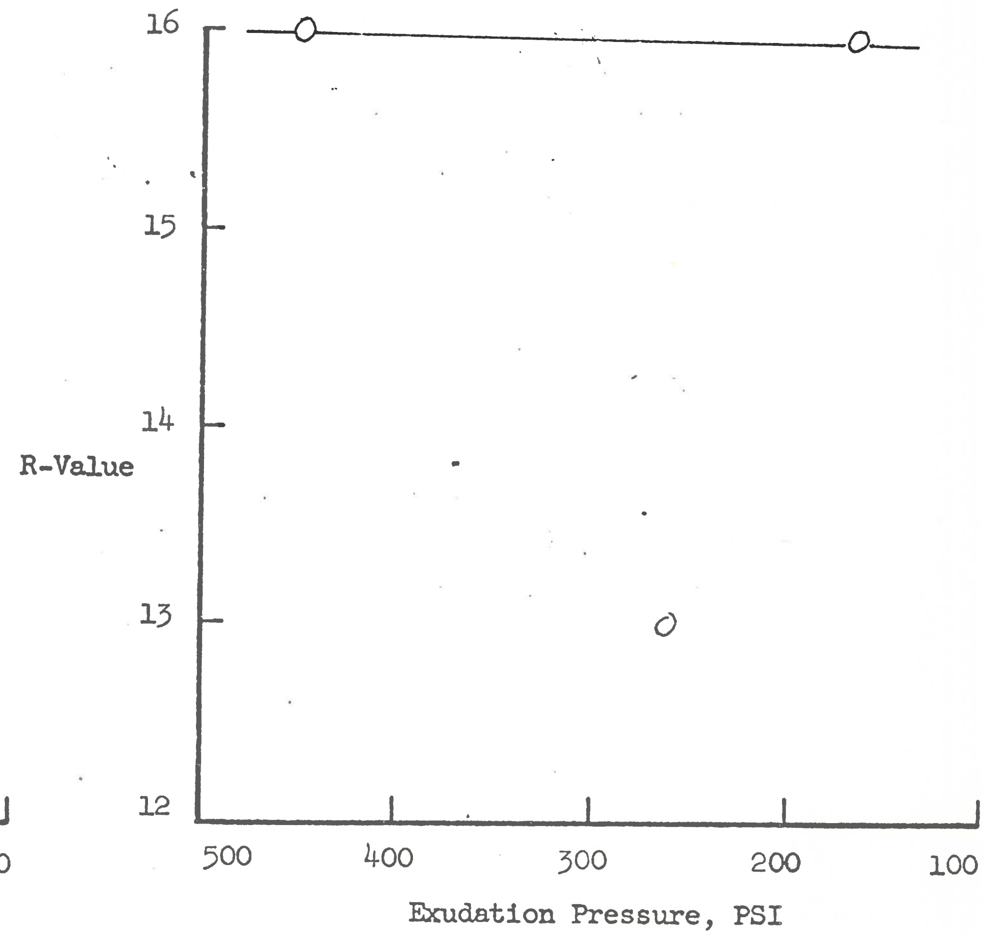


Summary of Data
California R-Value

Sample No.:	18
Date Tested:	8-30-65
Visual Description:	Brown Sandy Clay
R-Value at 240 PSI:	10
R-Value at 300 PSI:	10



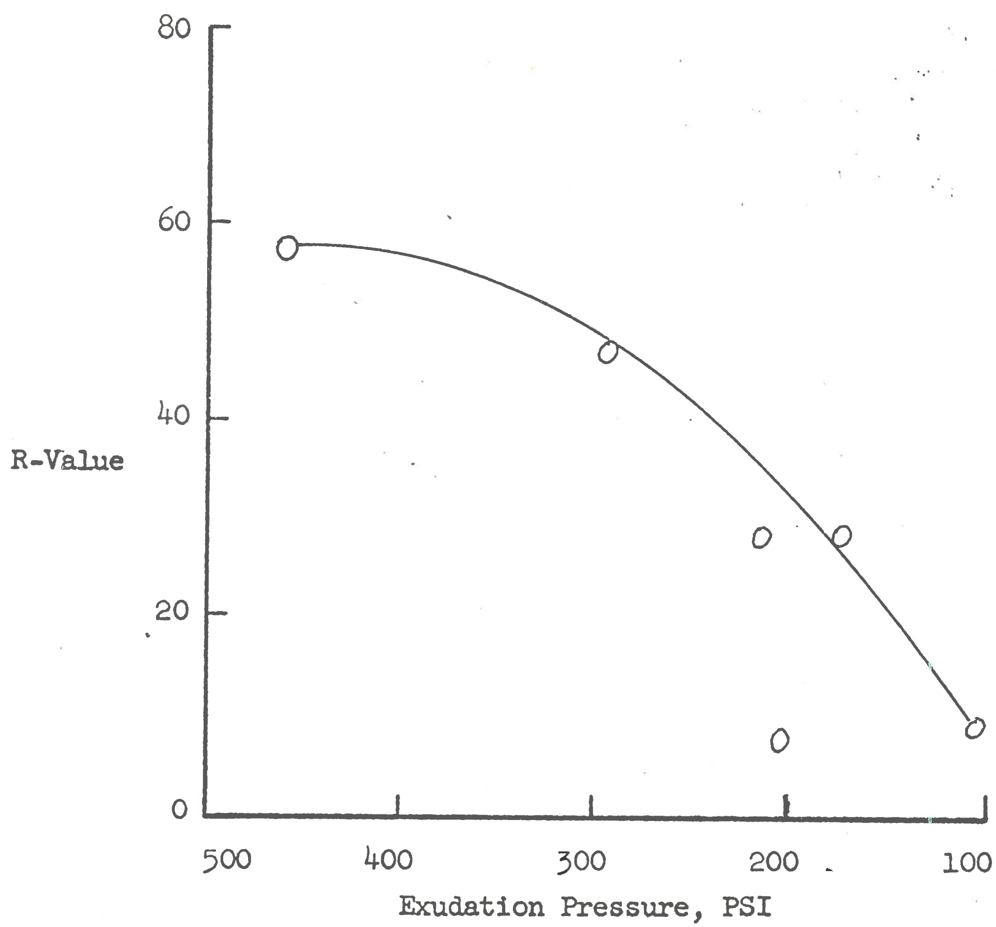
Sample No.:	19
Date Tested:	8-26-65
Visual Description:	Tan Silty Clay
R-Value at 240 PSI:	16
R-Value at 300 PSI:	16



Summary of Data
California R-Value

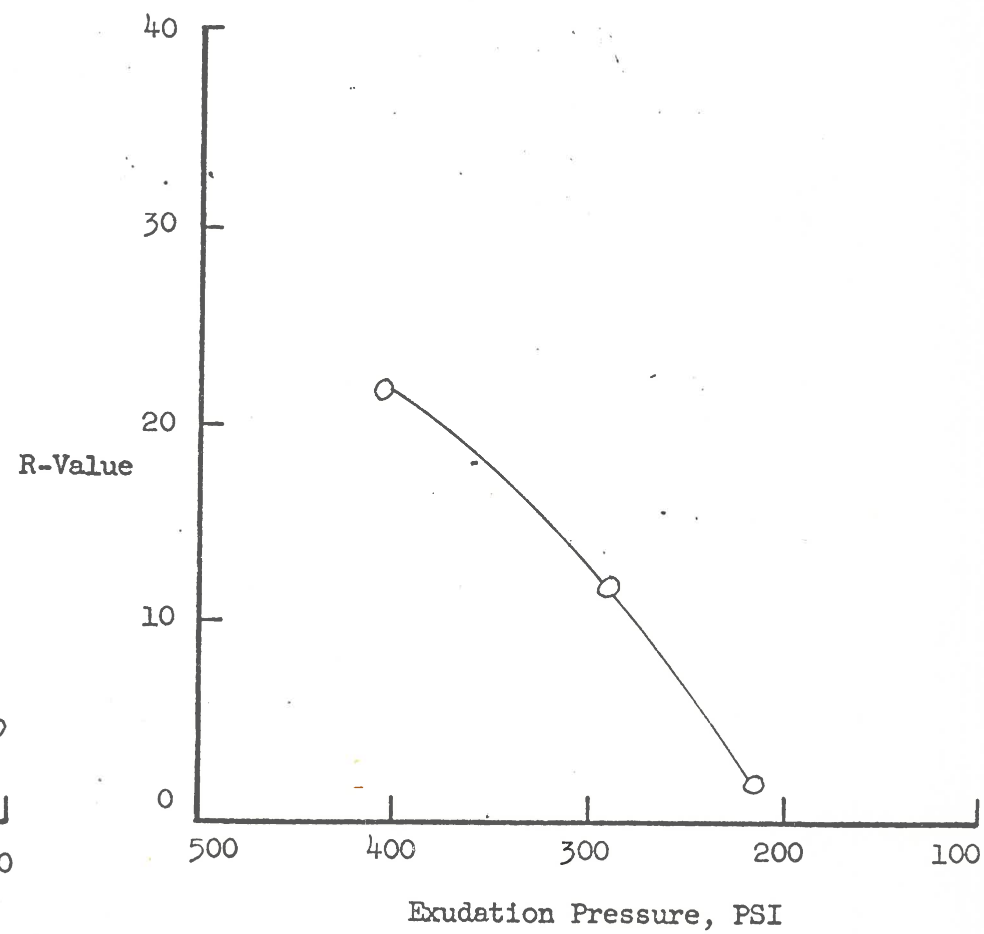
Sample No.: 20
Date Tested: 9-3-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 40
R-Value at 300 PSI: 50



Sample No.: 21
Date Tested: 9-3-65
Visual Description: Tan Sandy Clay

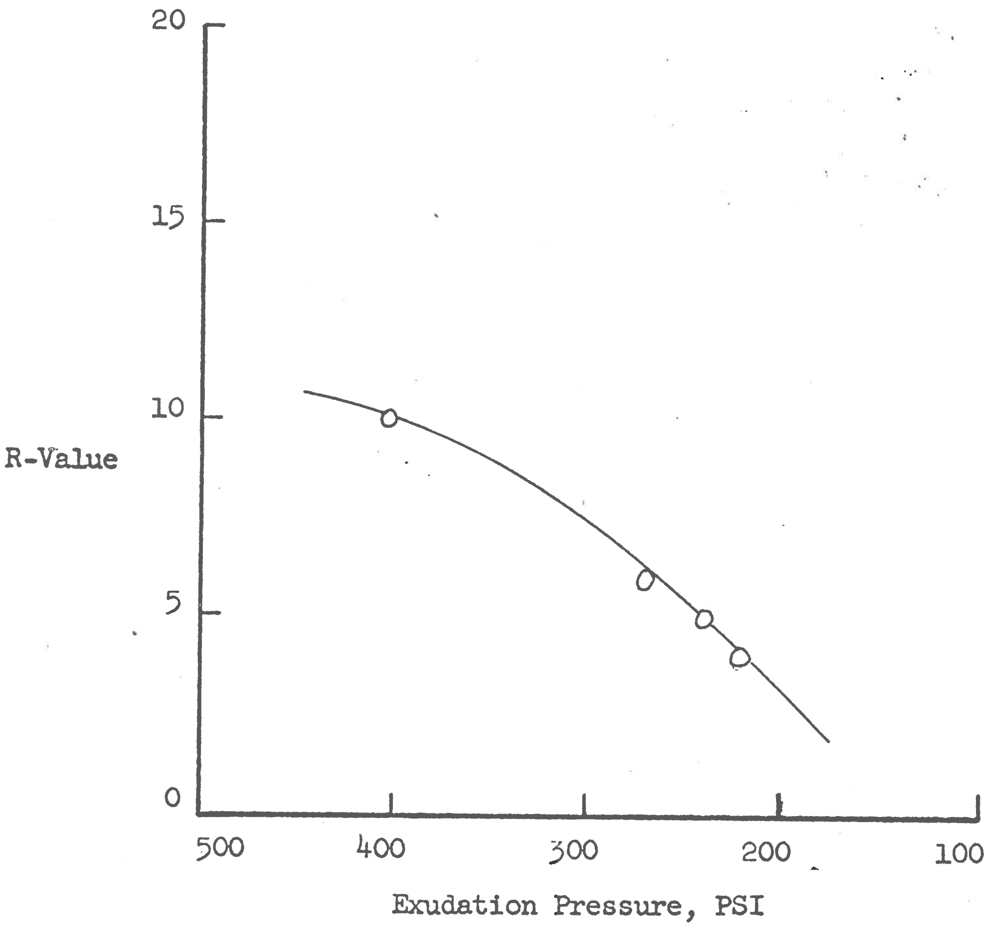
R-Value at 240 PSI: 05
R-Value at 300 PSI: 12



Summary of Data
California R-Value

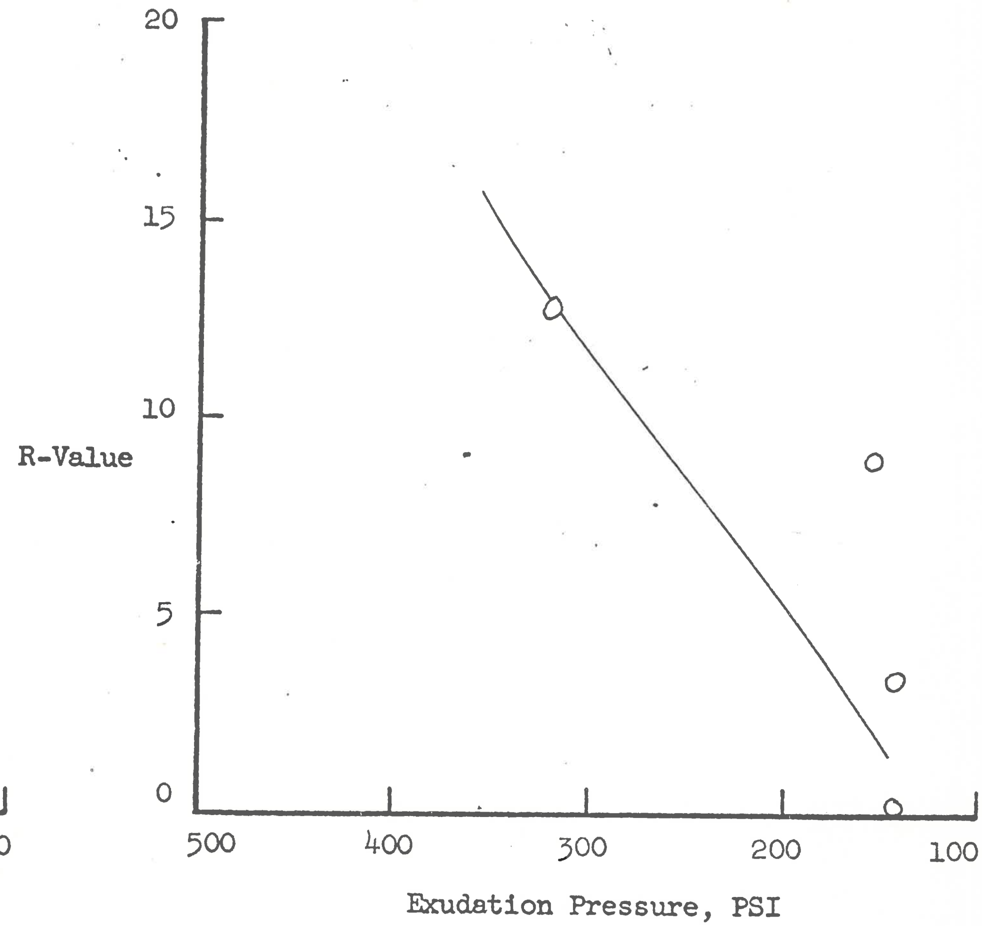
Sample No.: 22
Date Tested: 9-3-65
Visual Description: Brown Silty Clay

R-Value at 240 PSI: 05
R-Value at 300 PSI: 08



Sample No.: 23
Date Tested: 9-1-65
Visual Description: Gray Sandy Silt

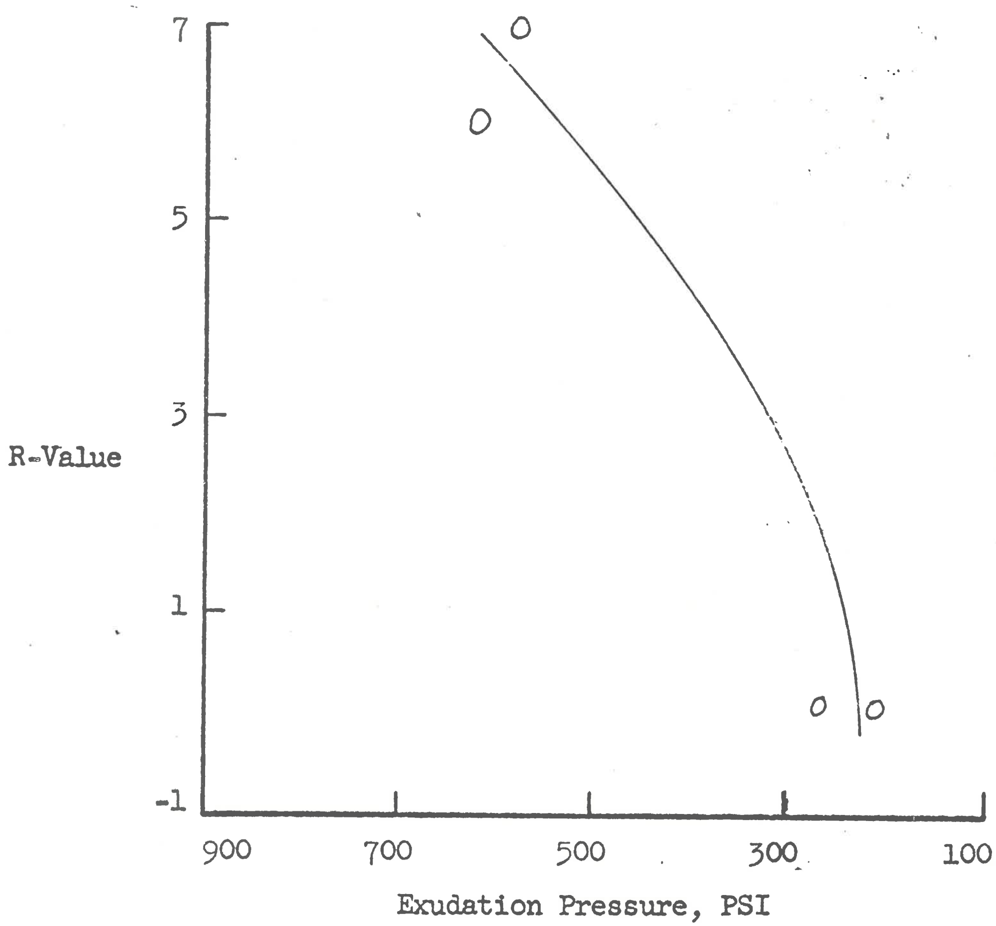
R-Value at 240 PSI: 08
R-Value at 300 PSI: 12



Summary of Data
California R-Value

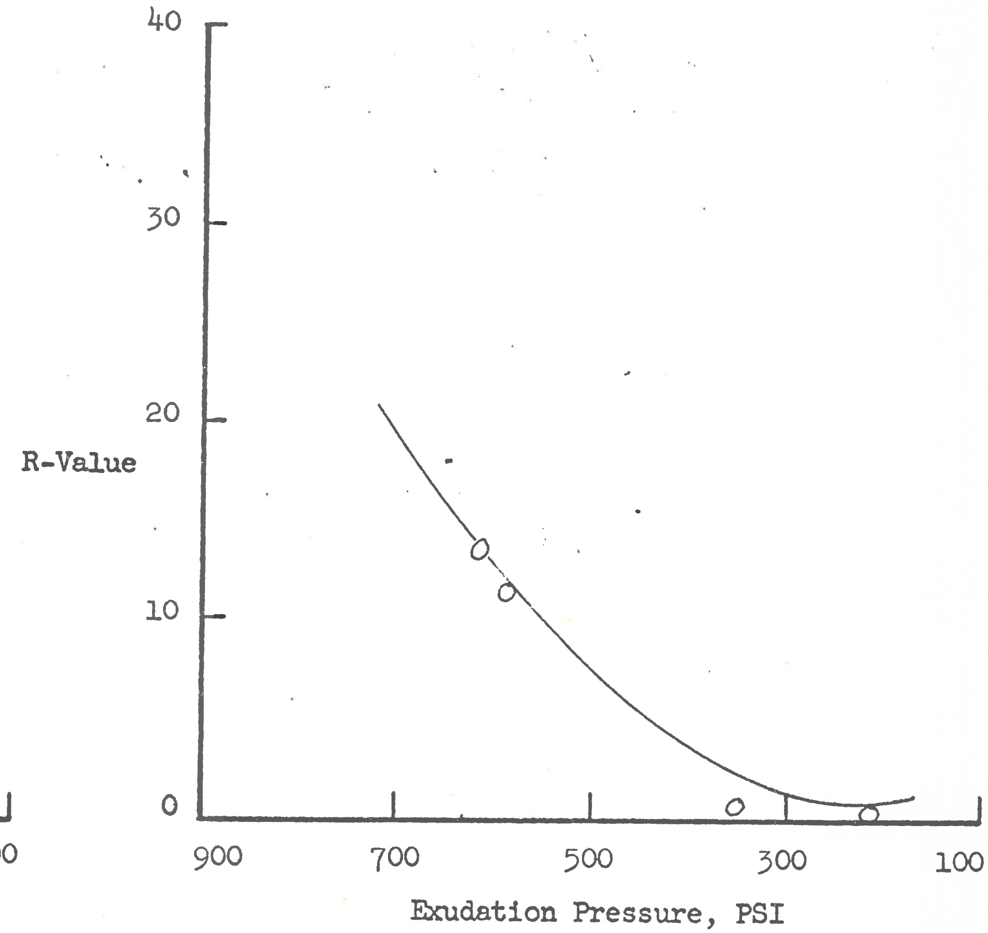
Sample No.: 24
Date Tested: 9-1-65
Visual Description: Tan Clay

R-Value at 240 PSI: 02
R-Value at 300 PSI: 03



Sample No.: 25
Date Tested: 9-1-65
Visual Description: Tan Clay

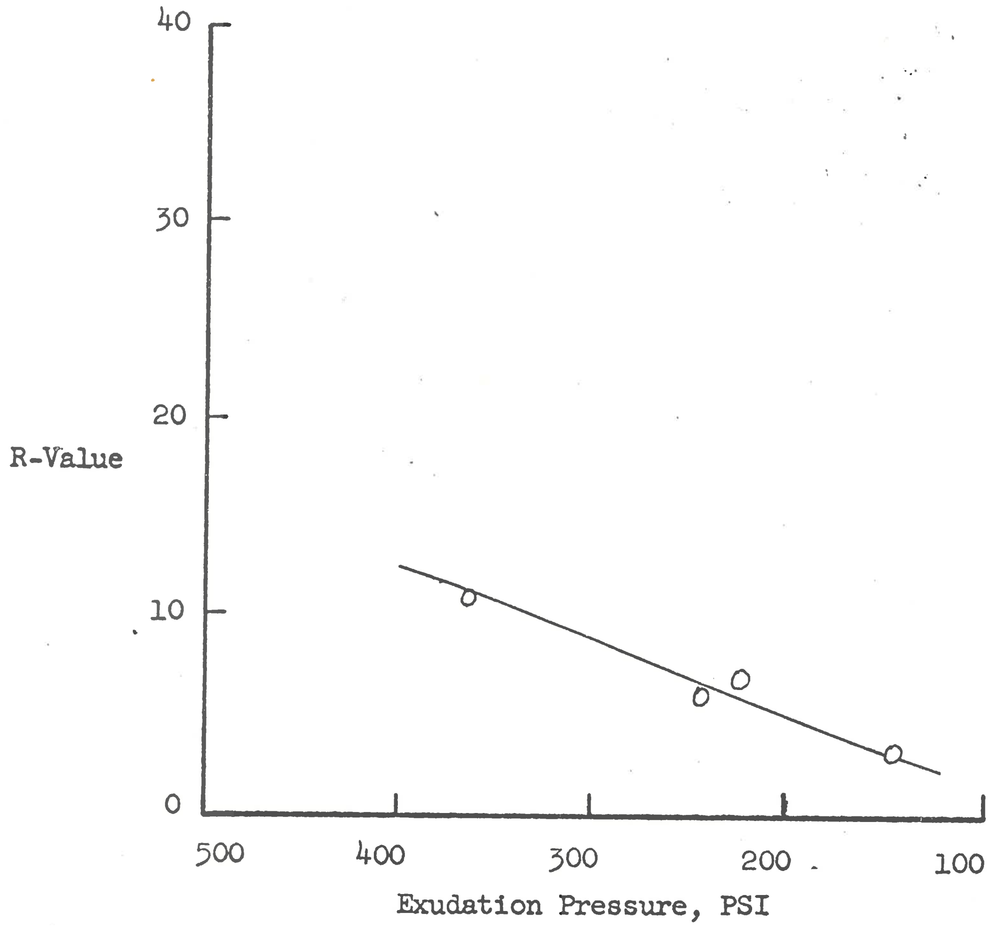
R-Value at 240 PSI: 01
R-Value at 300 PSI: 02



Summary of Data
California R-Value

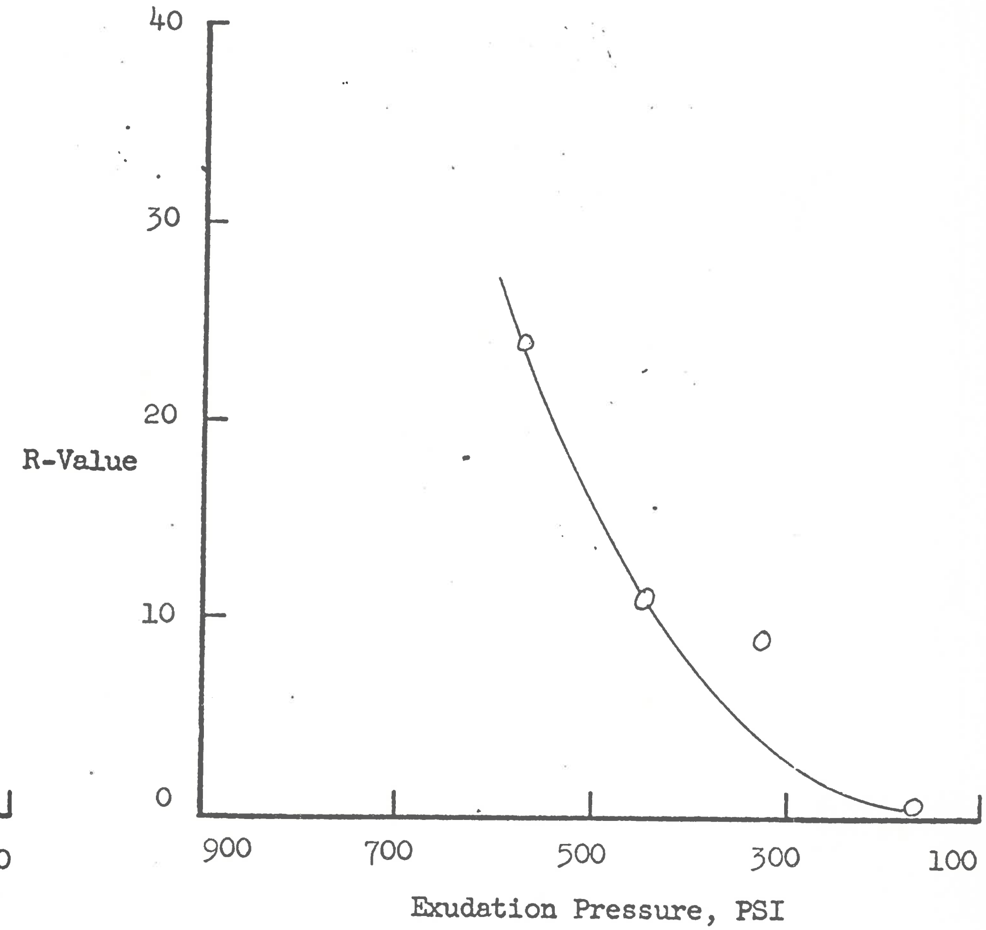
Sample No.: 26
Date Tested: 9-9-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 07
R-Value at 300 PSI: 09



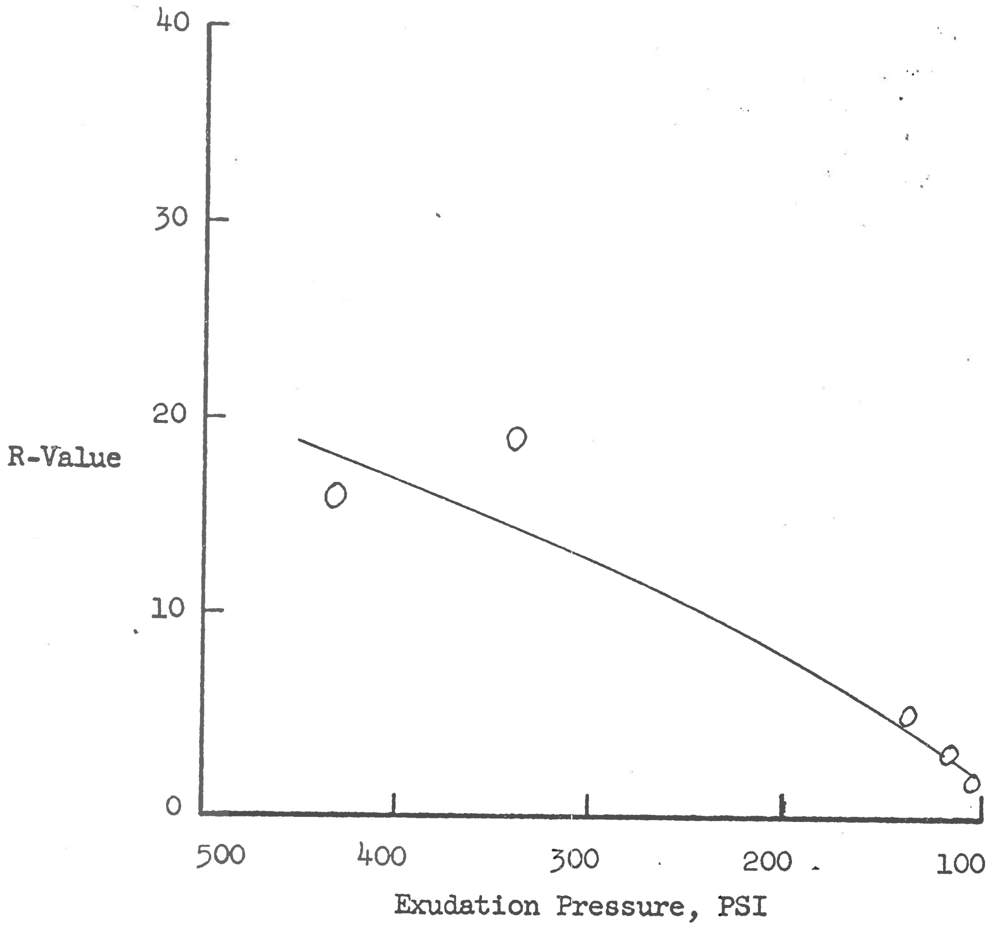
Sample No.: 27
Date Tested: 9-14-65
Visual Description: Yellowish Tan Sandy Clay

R-Value at 240 PSI: 01
R-Value at 300 PSI: 03

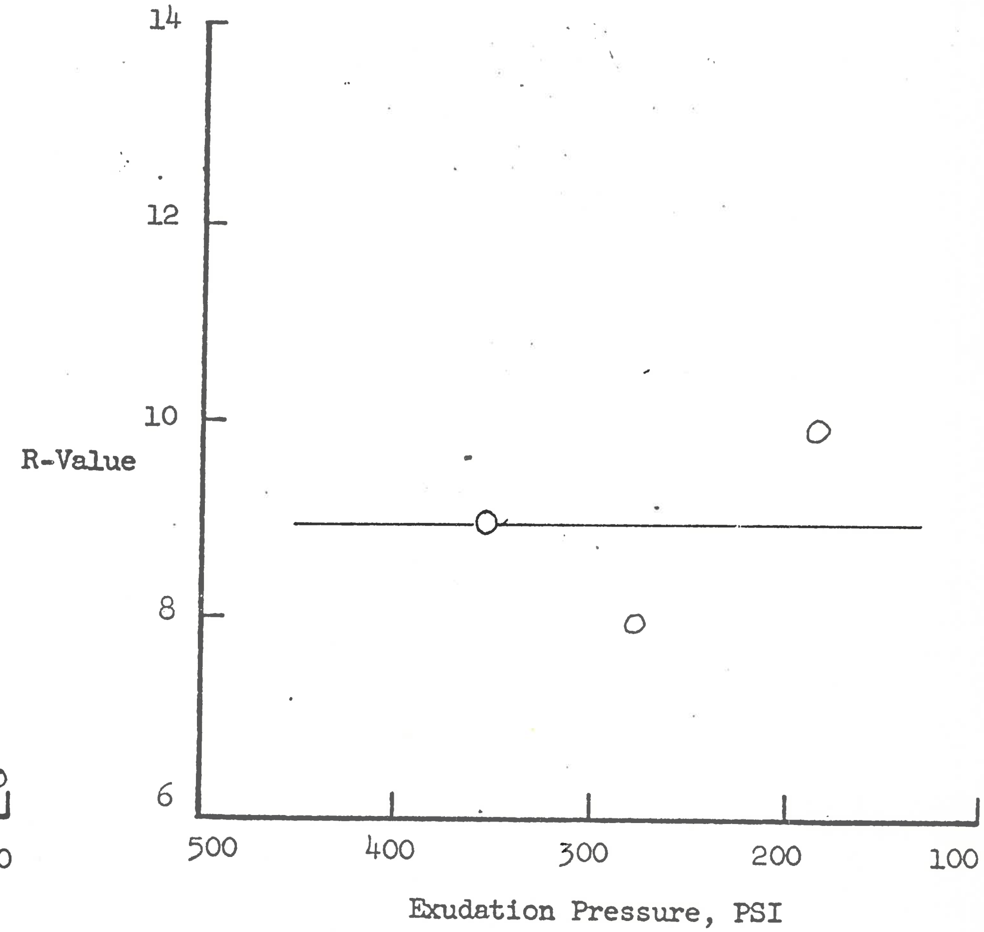


Summary of Data
California R-Value

Sample No.:	28
Date Tested:	9-1-65
Visual Description:	Red Clay
R-Value at 240 PSI:	10
R-Value at 300 PSI:	13

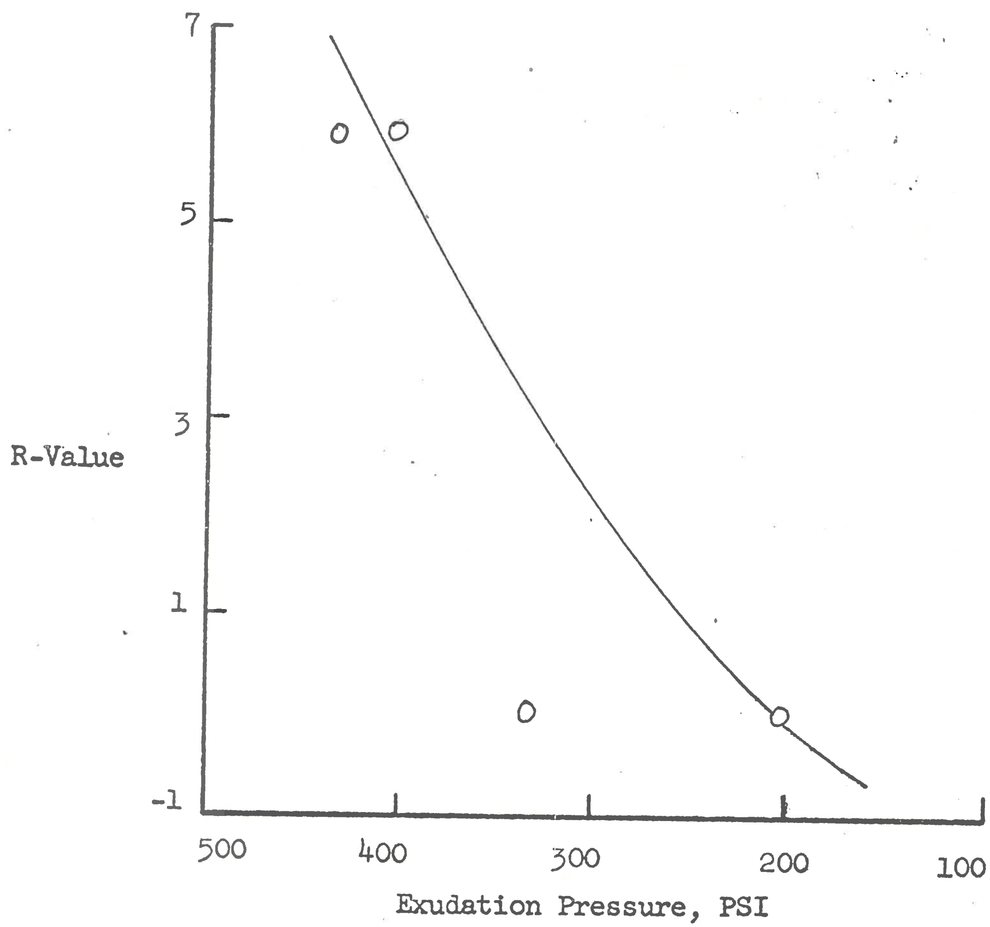


Sample No.:	29
Date Tested:	9-13-65
Visual Description:	Red Sandy Clay
R-Value at 240 PSI:	09
R-Value at 300 PSI:	09

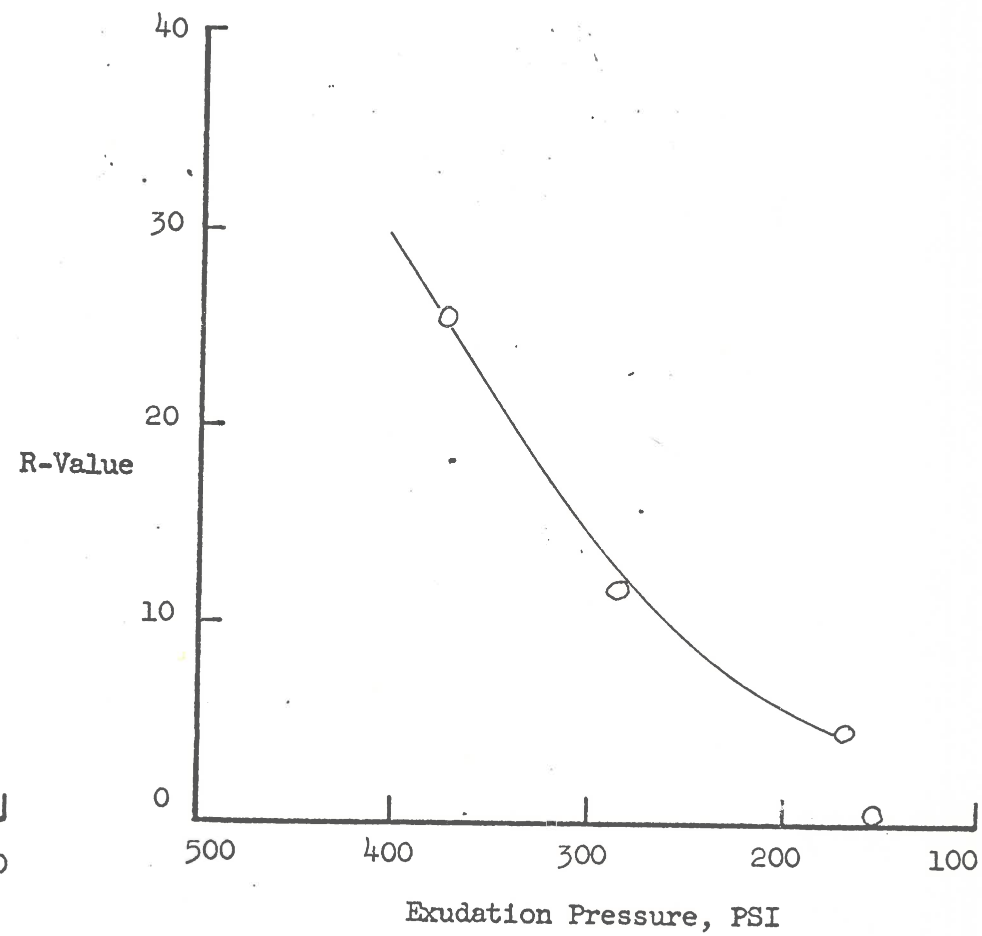


Summary of Data
California R-Value

Sample No.:	30
Date Tested:	9-1-65
Visual Description:	Brown Silty Clay
R-Value at 240 PSI:	01
R-Value at 300 PSI:	02



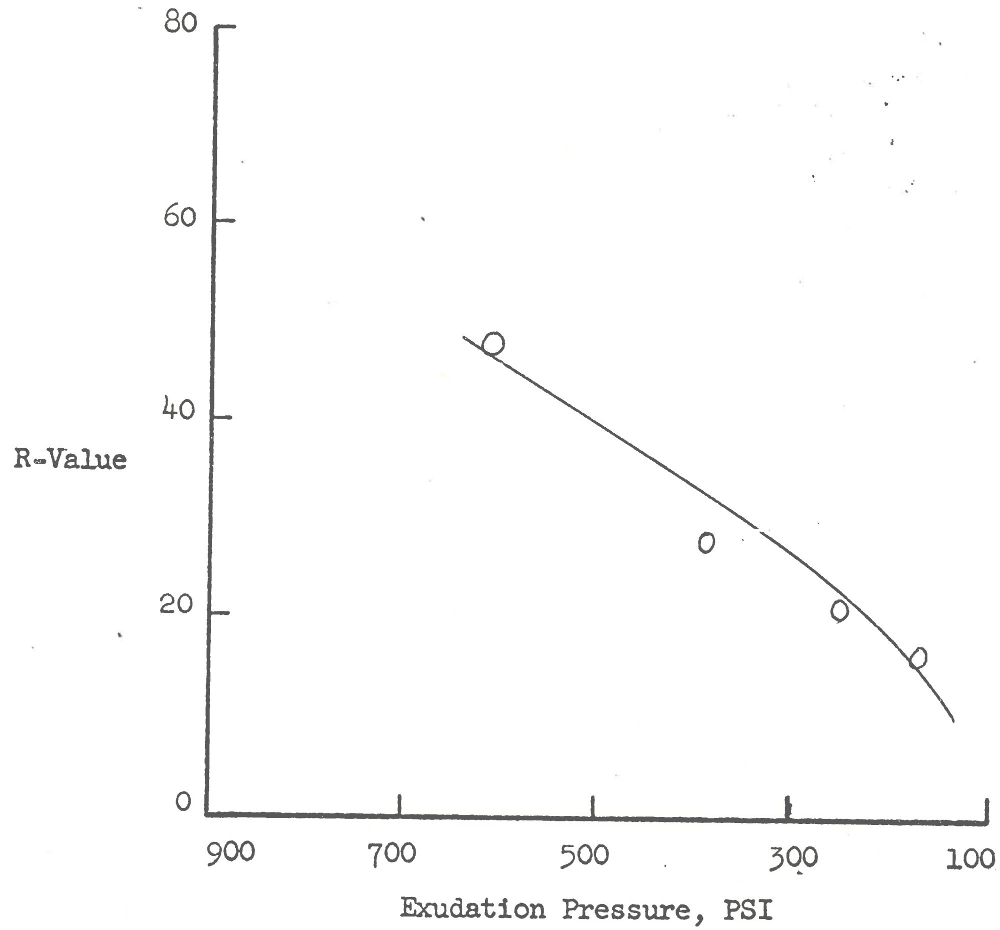
Sample No.:	31
Date Tested:	9-1-65
Visual Description:	Tan Silty Clay
R-Value at 240 PSI:	09
R-Value at 300 PSI:	15



Summary of Data
California R-Value

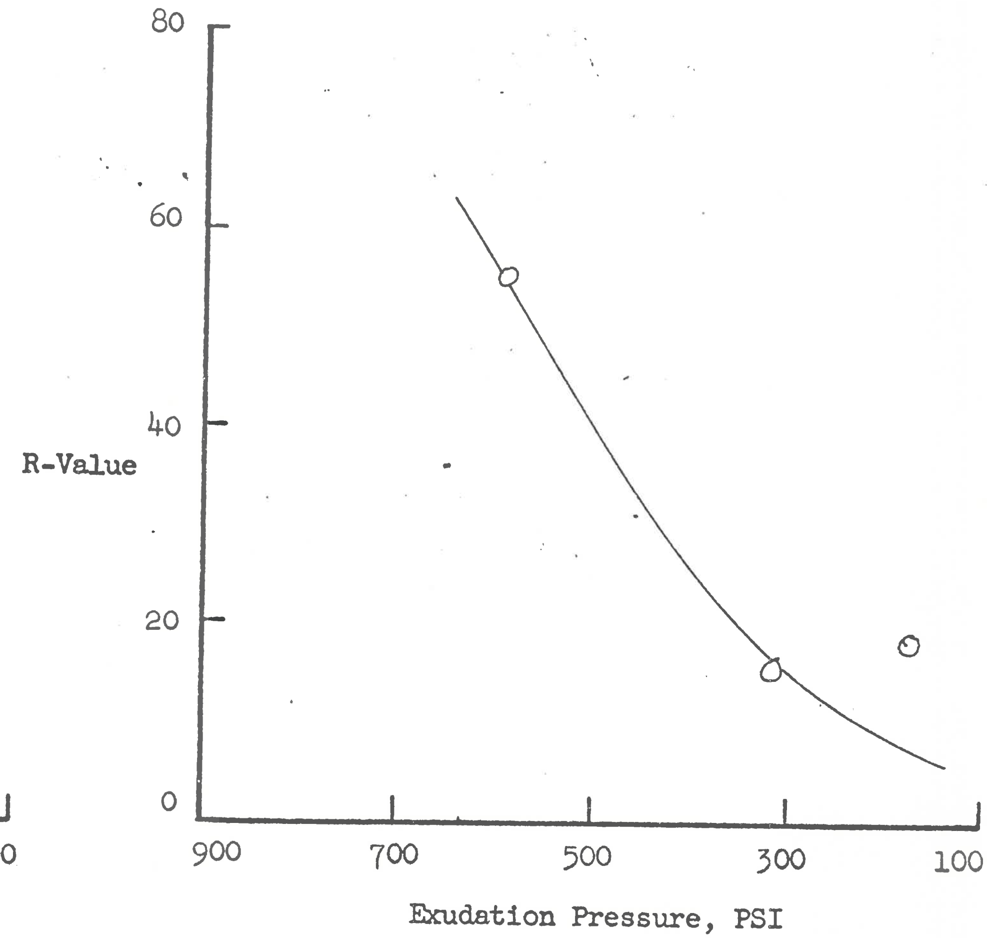
Sample No.: 32
Date Tested: 9-1-65
Visual Description: Brown Sandy Clay

R-Value at 240 PSI: 20
R-Value at 300 PSI: 25



Sample No.: 33
Date Tested: 9-1-65
Visual Description: Tan Sandy Clay

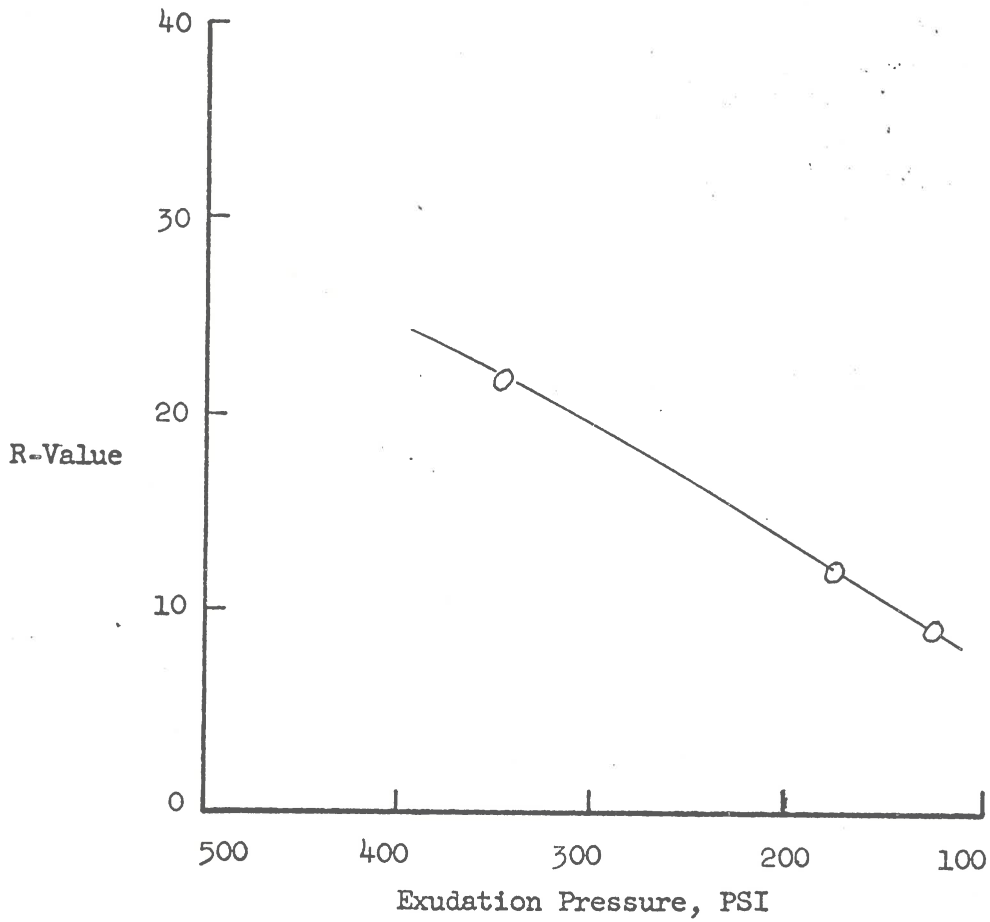
R-Value at 240 PSI: 12
R-Value at 300 PSI: 18



Summary of Data
California R-Value

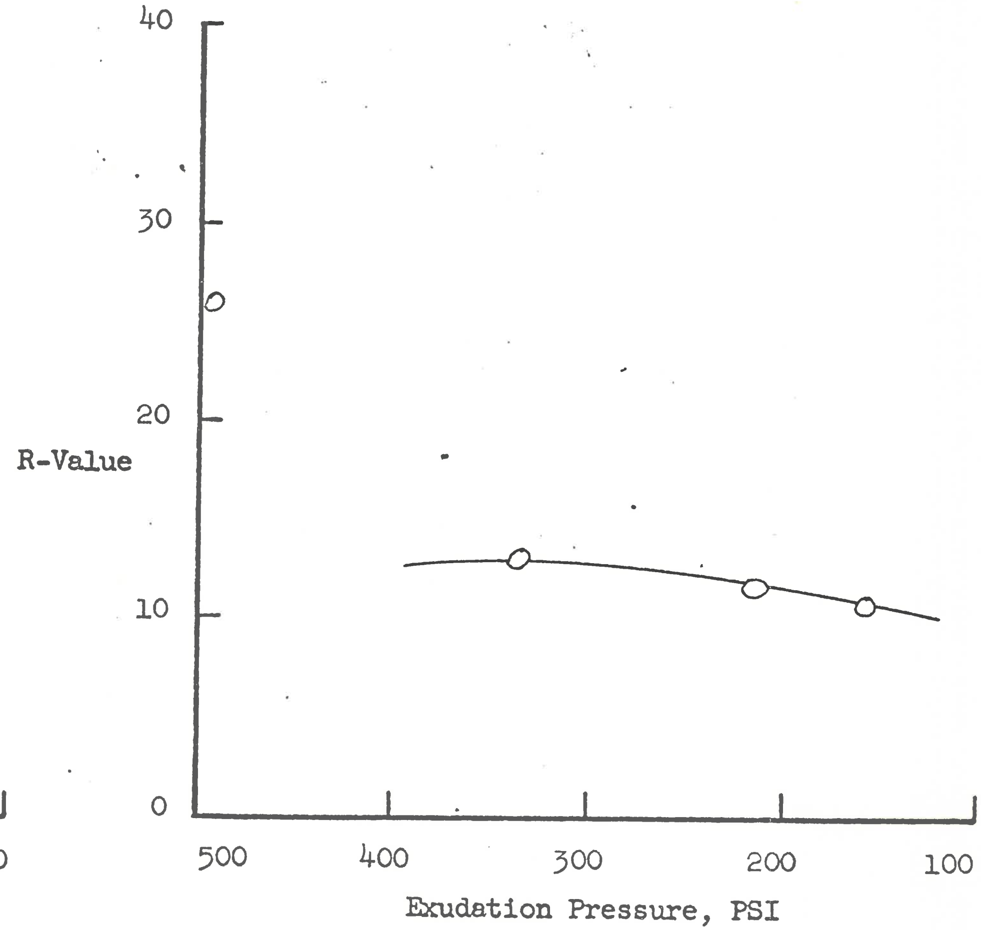
Sample No.: 34
Date Tested: 9-7-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 16
R-Value at 300 PSI: 20



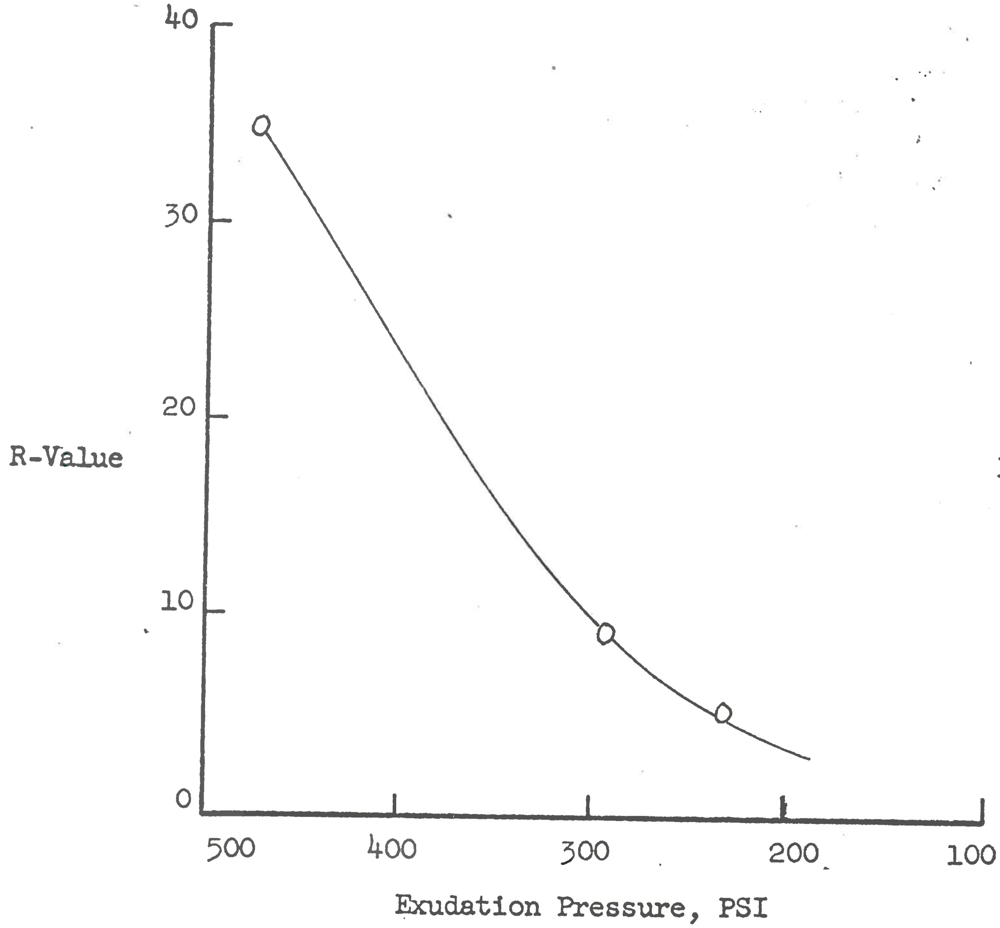
Sample No.: 35
Date Tested: 9-7-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 13
R-Value at 300 PSI: 13

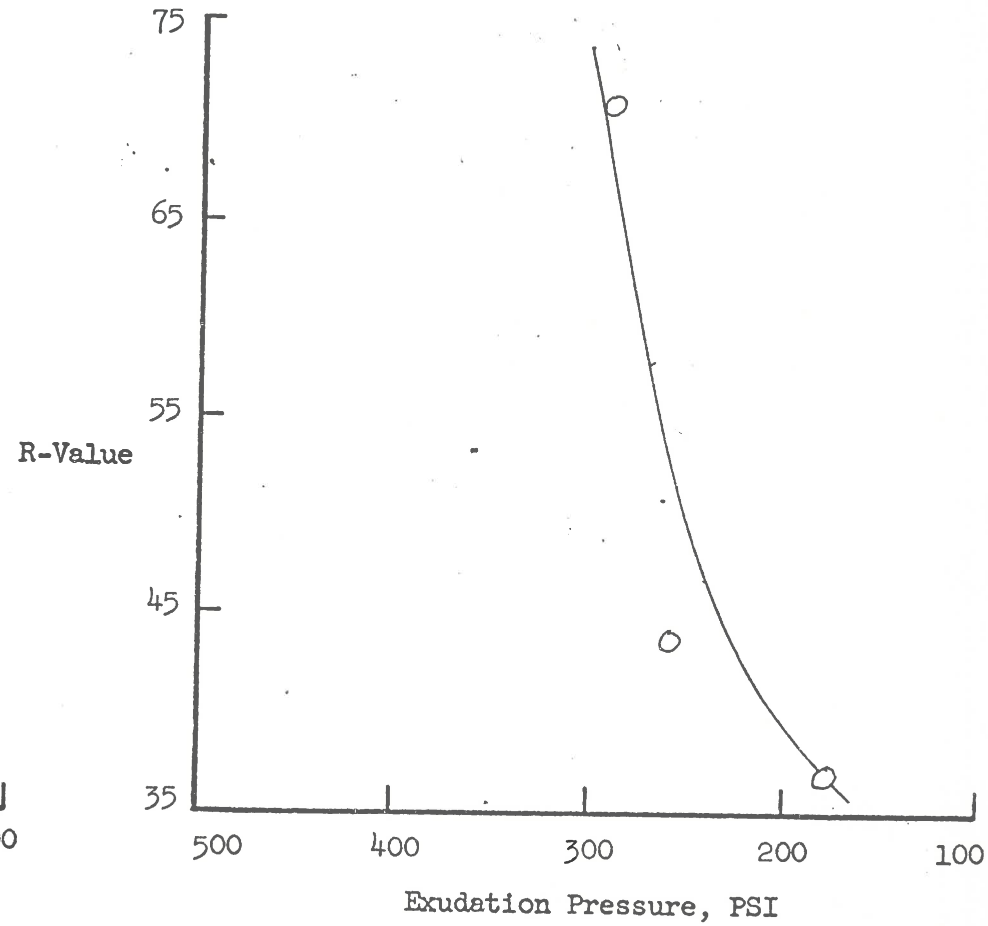


Summary of Data
California R-Value

Sample No.:	36
Date Tested:	9-7-65
Visual Description:	Reddish Brown Clay
R-Value at 240 PSI:	05
R-Value at 300 PSI:	10



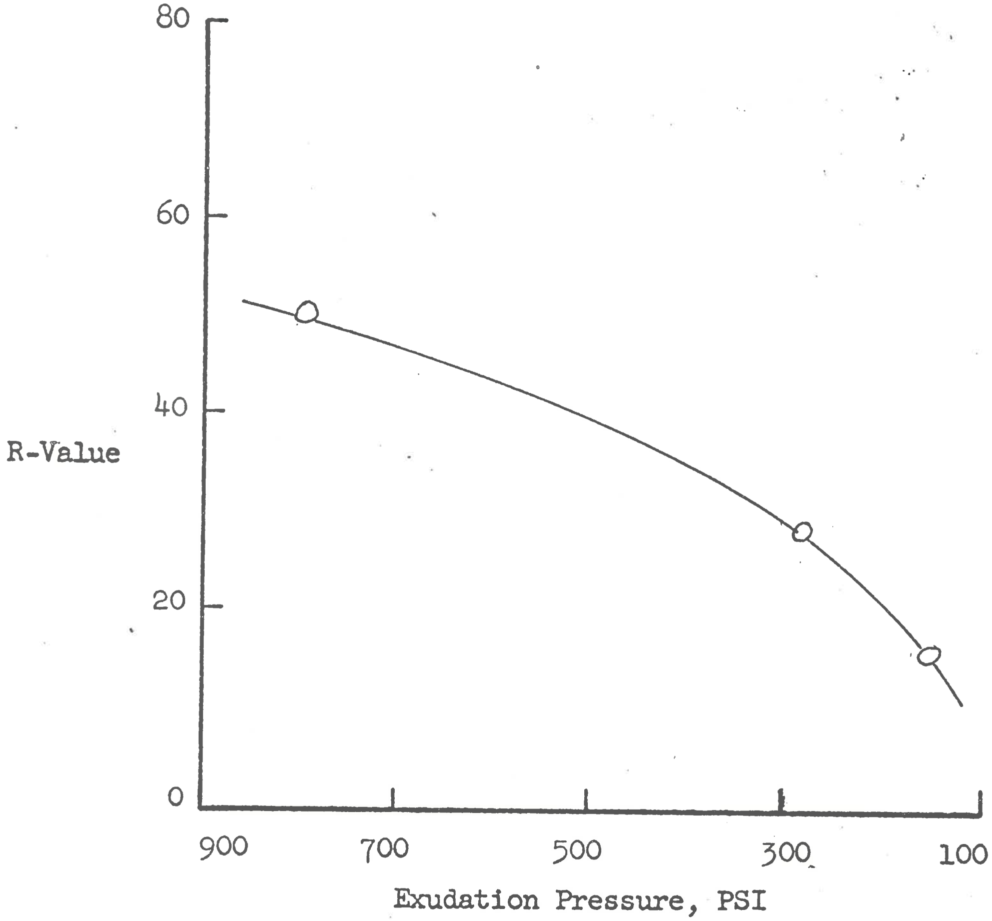
Sample No.:	37
Date Tested:	9-7-65
Visual Description:	Brown Silty Clay
R-Value at 240 PSI:	47
R-Value at 300 PSI:	74



Summary of Data
California R-Value

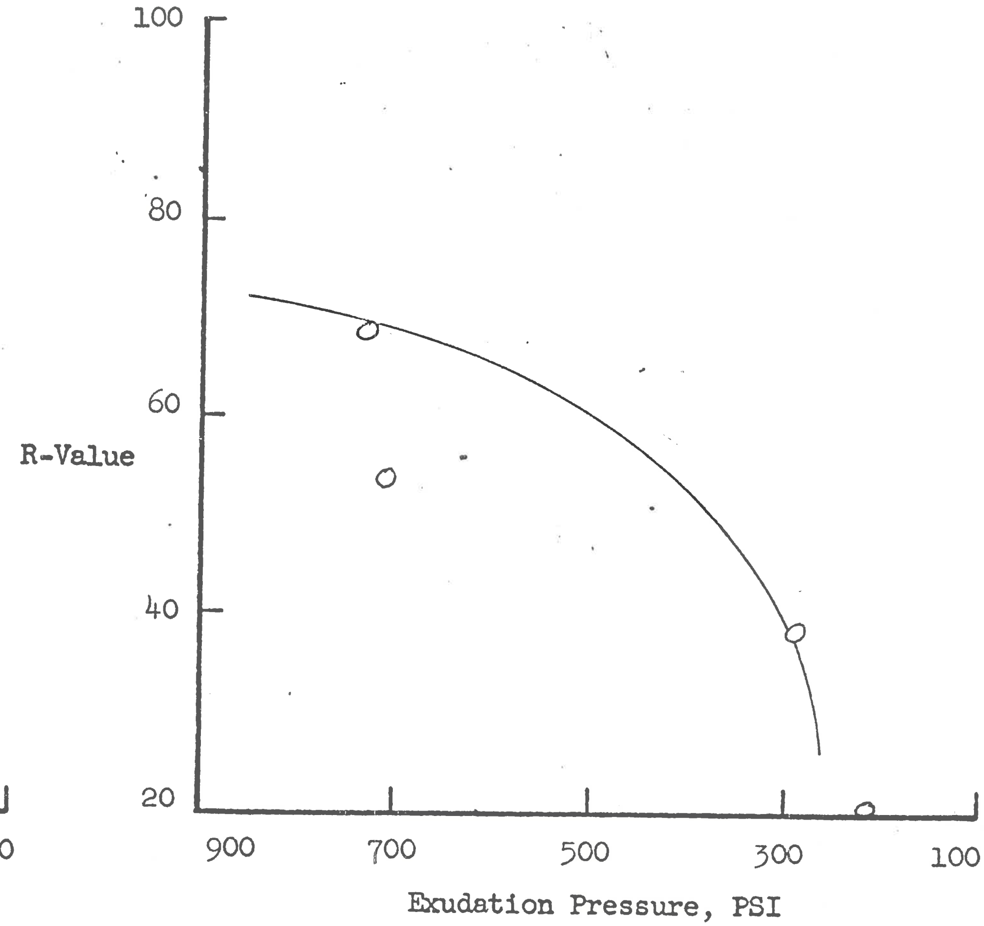
Sample No.: 38
Date Tested: 9-3-65
Visual Description: Brown Silty Clay

R-Value at 240 PSI: 24
R-Value at 300 PSI: 29



Sample No.: 39
Date Tested: 9-8-65
Visual Description: Tan Silty Clay

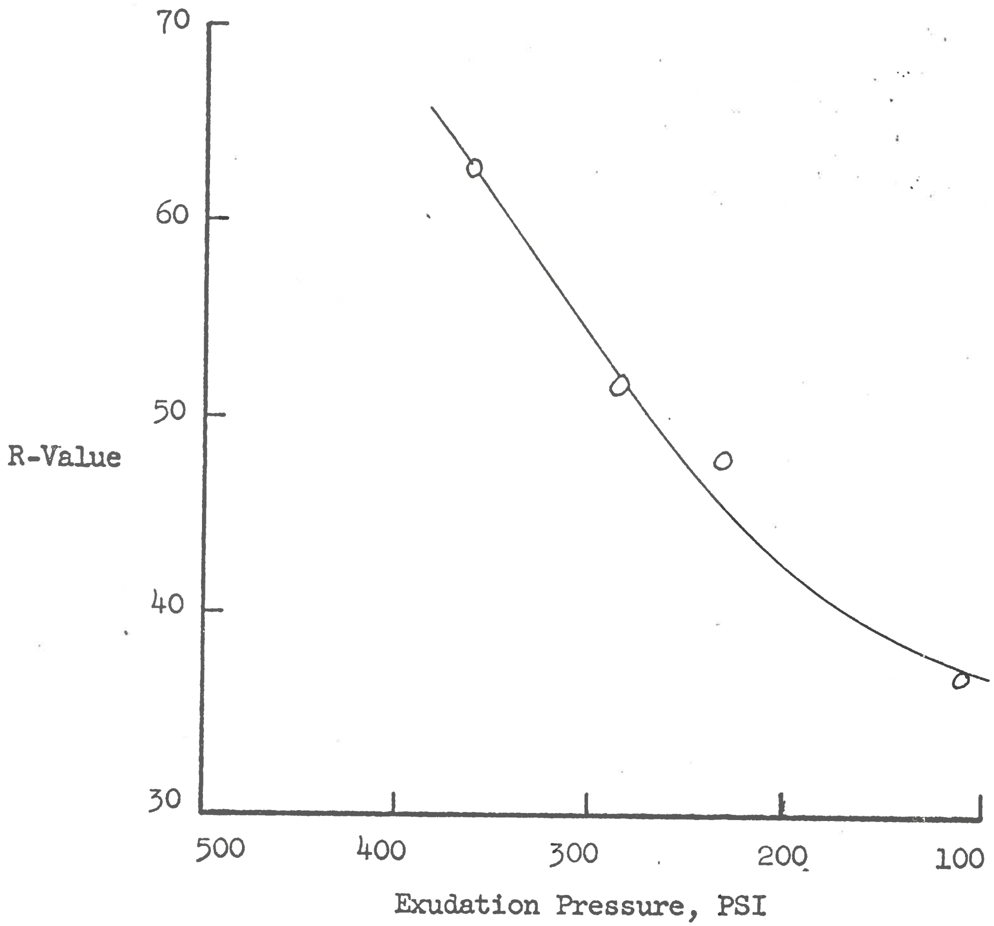
R-Value at 240 PSI: 30
R-Value at 300 PSI: 40



Summary of Data
California R-Value

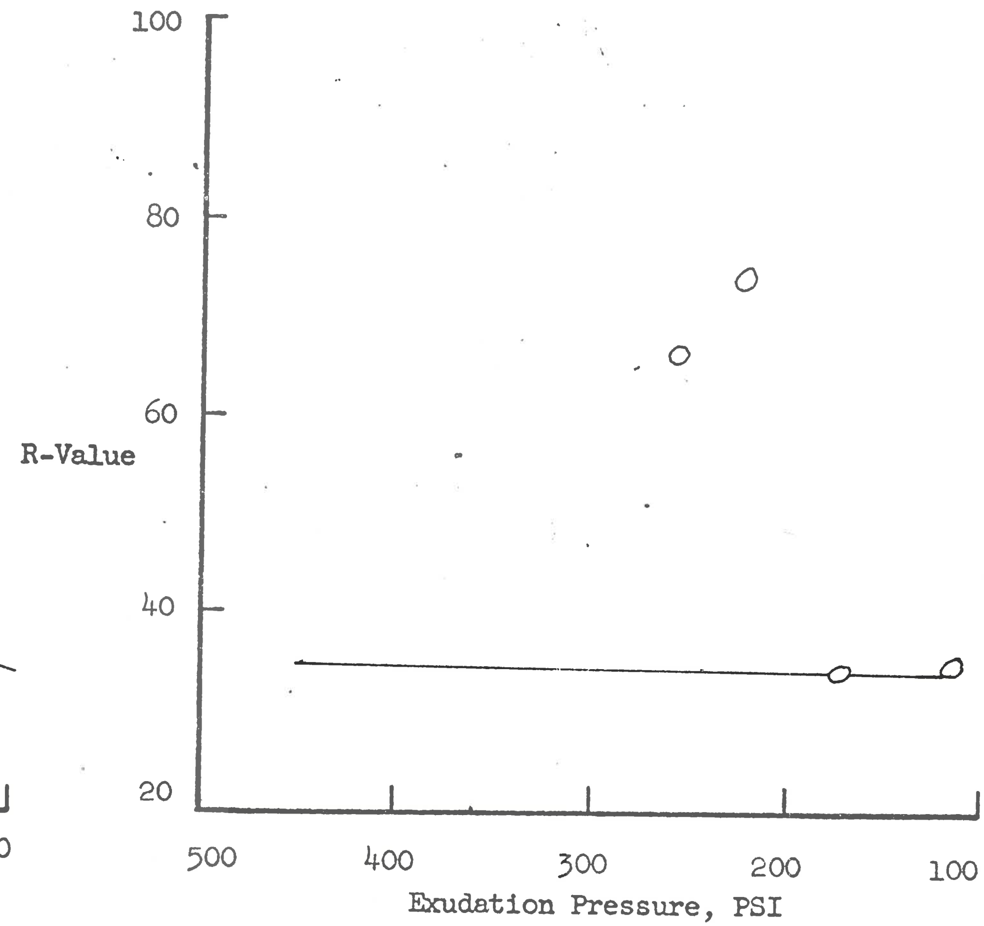
Sample No.: 40
Date Tested: 9-7-65
Visual Description: Sandy Silt

R-Value at 240 PSI: 49
R-Value at 300 PSI: 54



Sample No.: 41
Date Tested: 9-8-65
Visual Description: Sand

R-Value at 240 PSI: 35
R-Value at 300 PSI: 35



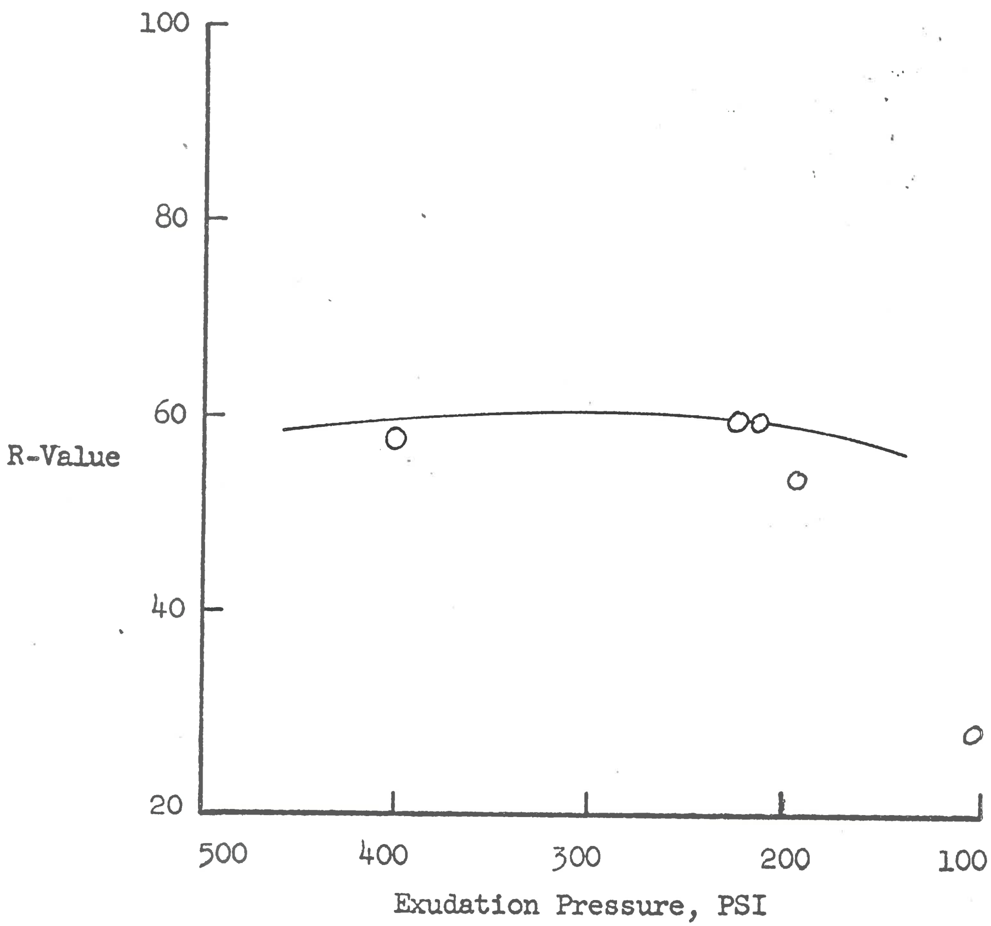
Summary of Data
California R-Value

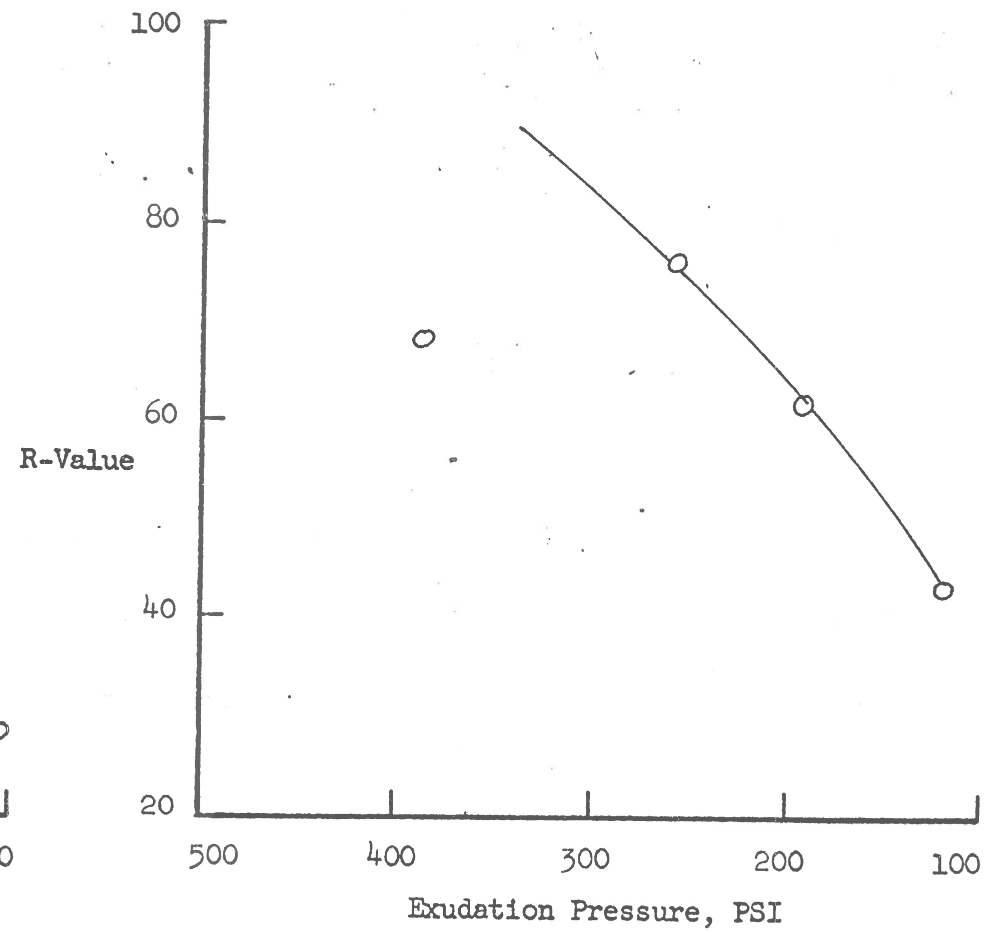
Sample No.: 42
Date Tested: 9-10-65
Visual Description: Red Sandy Gravel

R-Value at 240 PSI: 59
R-Value at 300 PSI: 62

Sample No.: 43
Date Tested: 9-9-65
Visual Description: Brown Sand

R-Value at 240 PSI: 75
R-Value at 300 PSI: 84

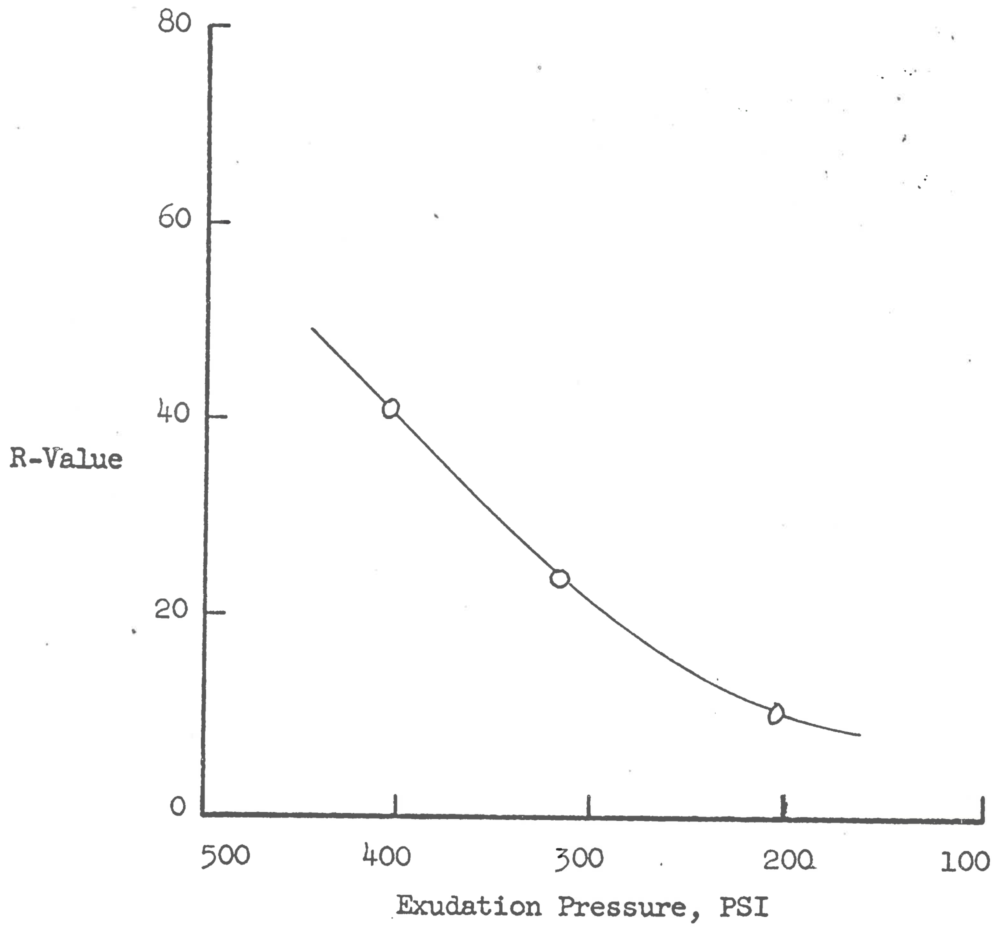




Summary of Data
California R-Value

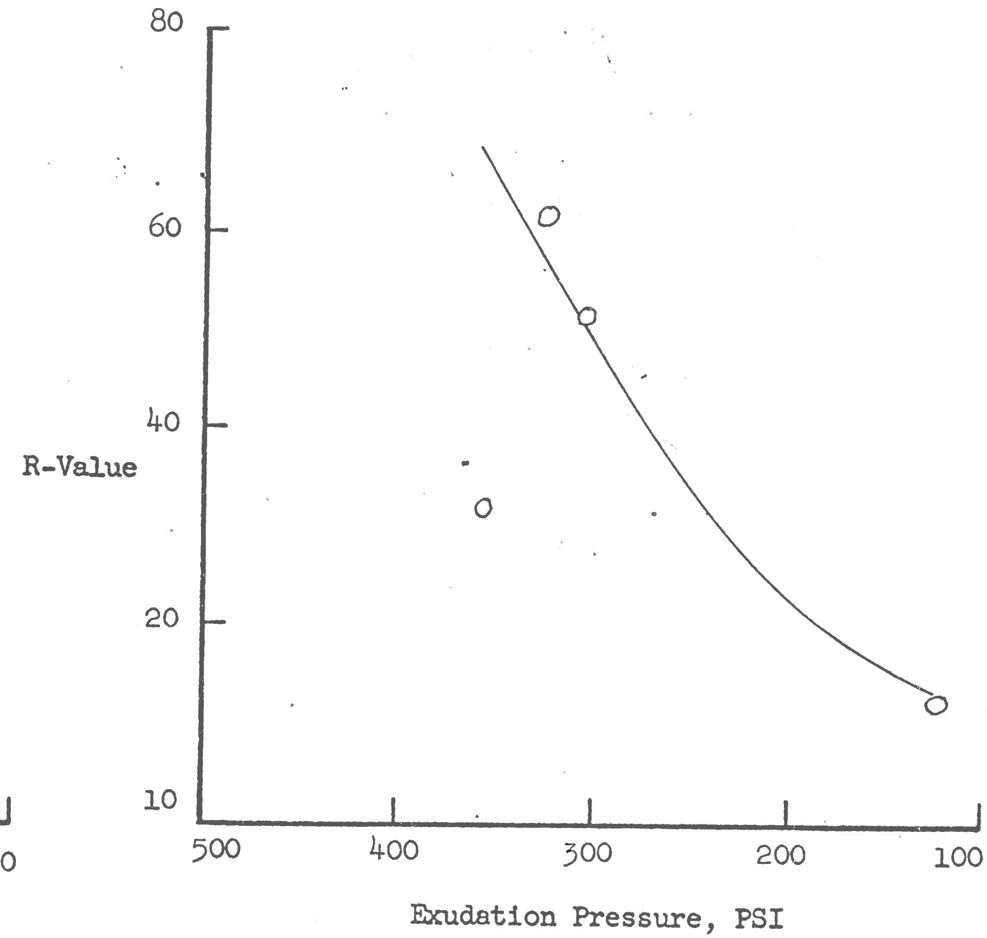
Sample No.: 44
Date Tested: 9-7-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 14
R-Value at 300 PSI: 21



Sample No.: 45
Date Tested: 9-8-65
Visual Description: Tan Silty Clay

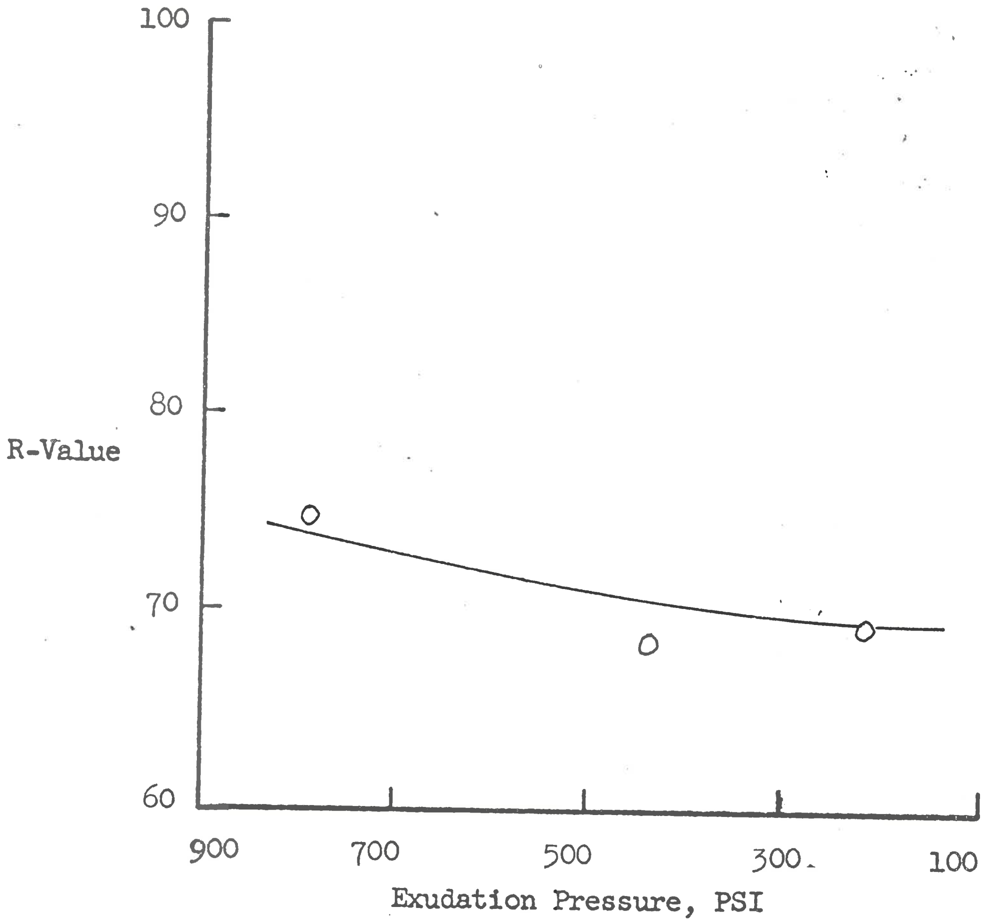
R-Value at 240 PSI: 32
R-Value at 300 PSI: 50



Summary of Data
California R-Value

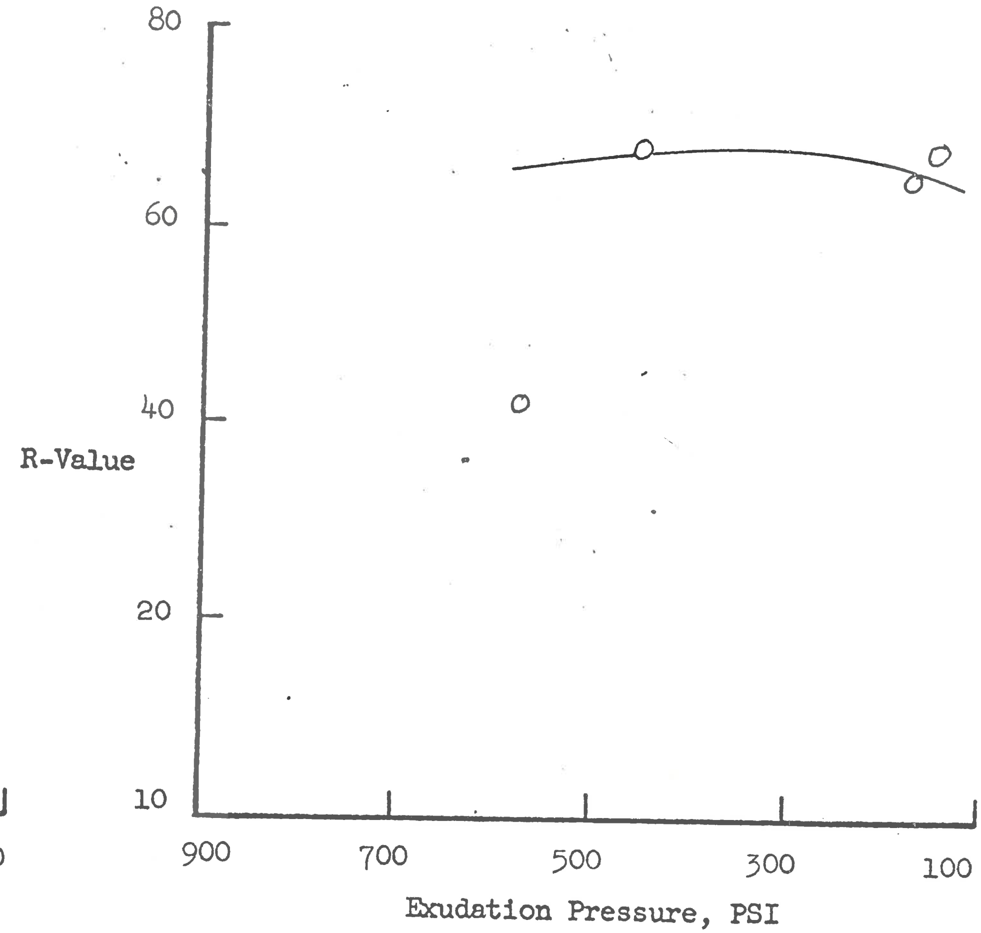
Sample No.: 46
Date Tested: 9-9-65
Visual Description: Brown Sand

R-Value at 240 PSI: 71
R-Value at 300 PSI: 72



Sample No.: 47
Date Tested: 9-9-65
Visual Description: Brown Sandy Gravel

R-Value at 240 PSI: 68
R-Value at 300 PSI: 69



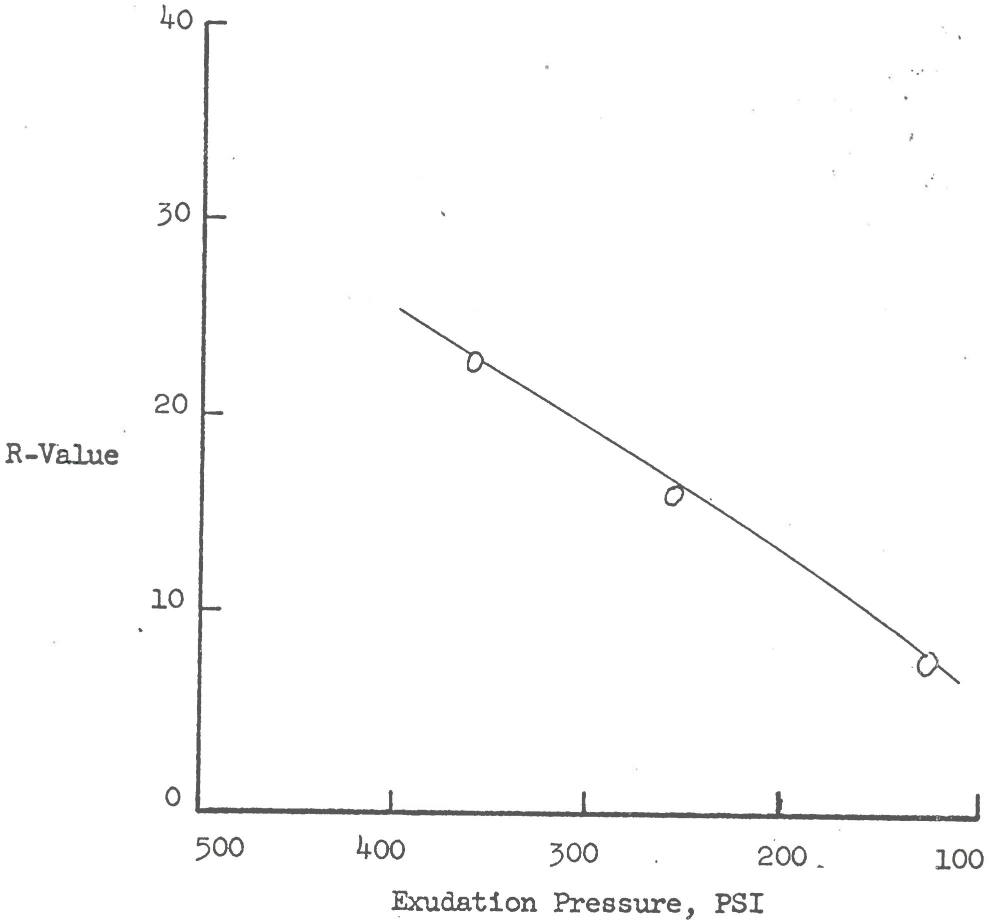
Summary of Data
California R-Value

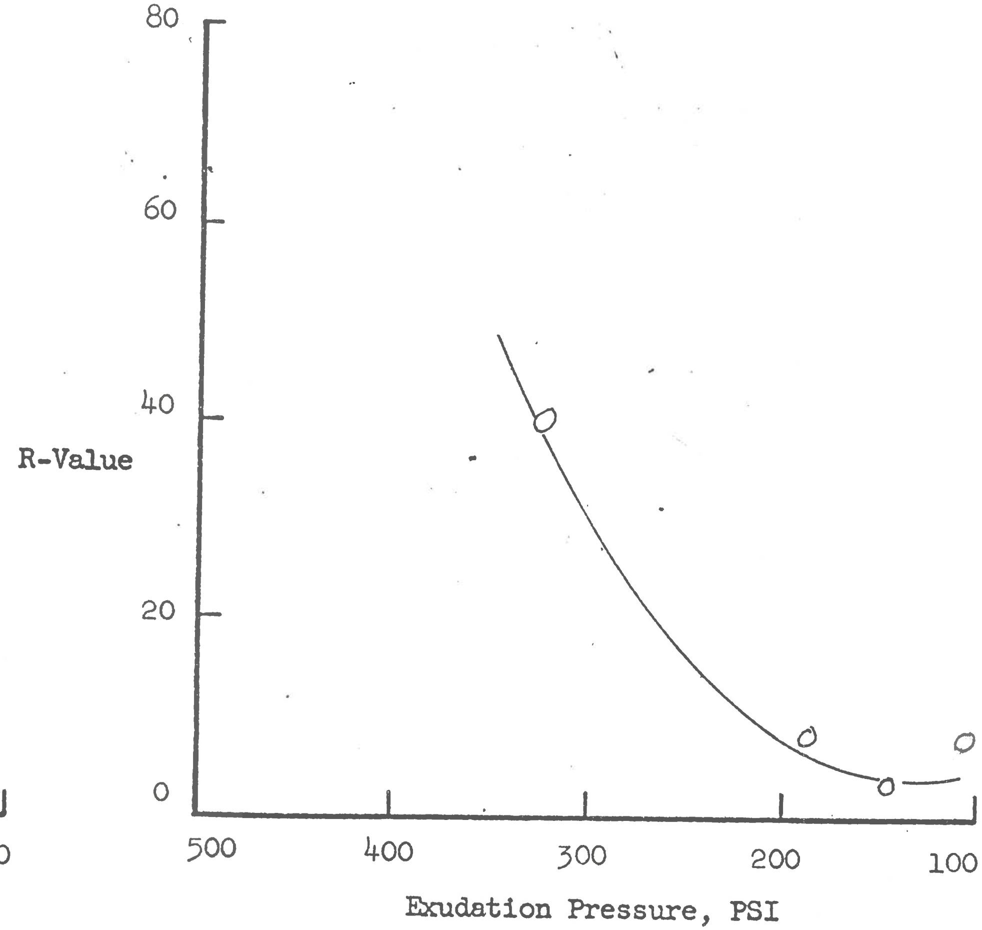
Sample No.: 48
Date Tested: 9-9-65
Visual Description: Red Sand

R-Value at 240 PSI: 16
R-Value at 300 PSI: 20

Sample No.: 49
Date Tested: 9-9-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 15
R-Value at 300 PSI: 32





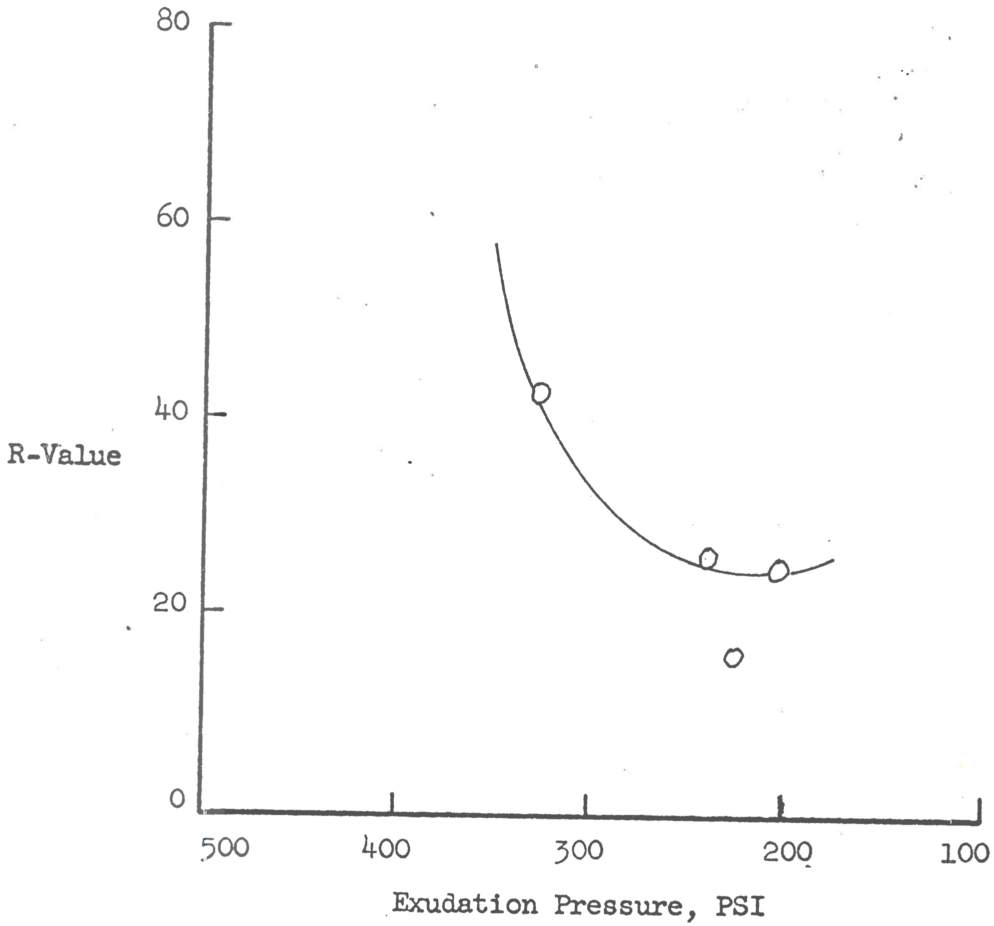
Summary of Data
California R-Value

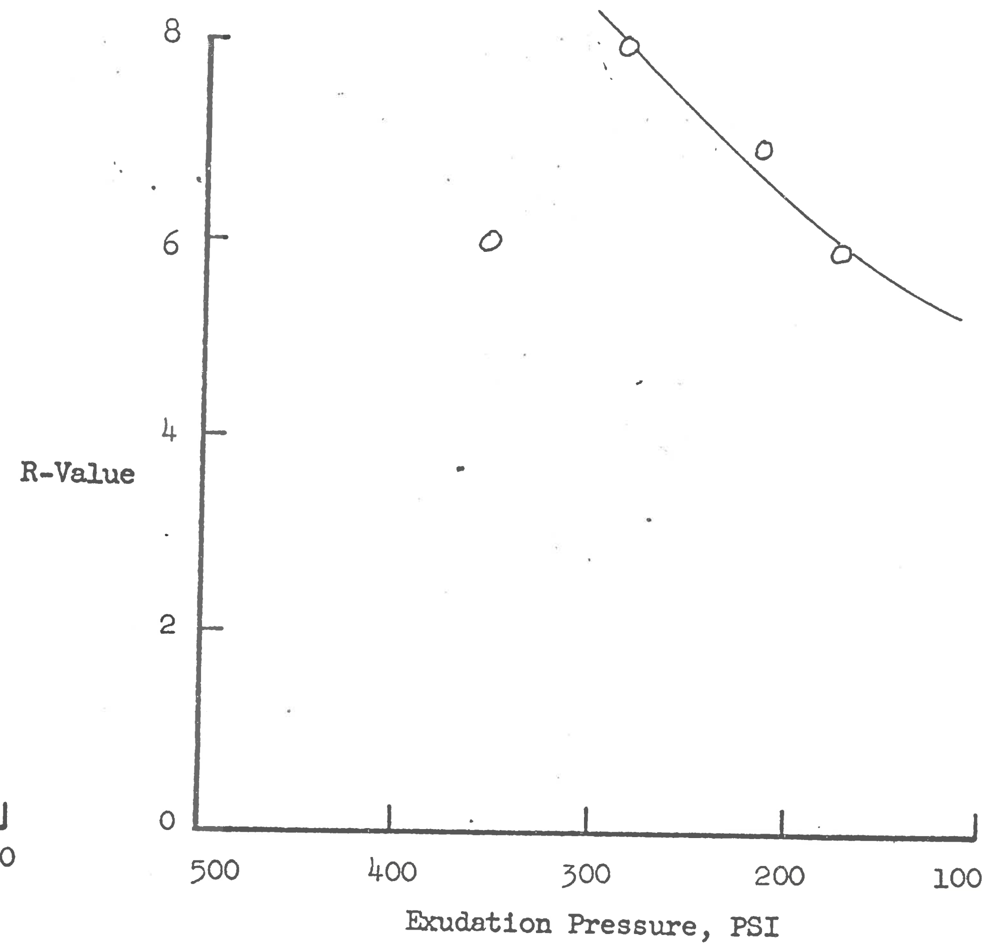
Sample No.: 50
Date Tested: 9-9-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 26
R-Value at 300 PSI: 32

Sample No.: 51
Date Tested: 9-13-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 07
R-Value at 300 PSI: 09

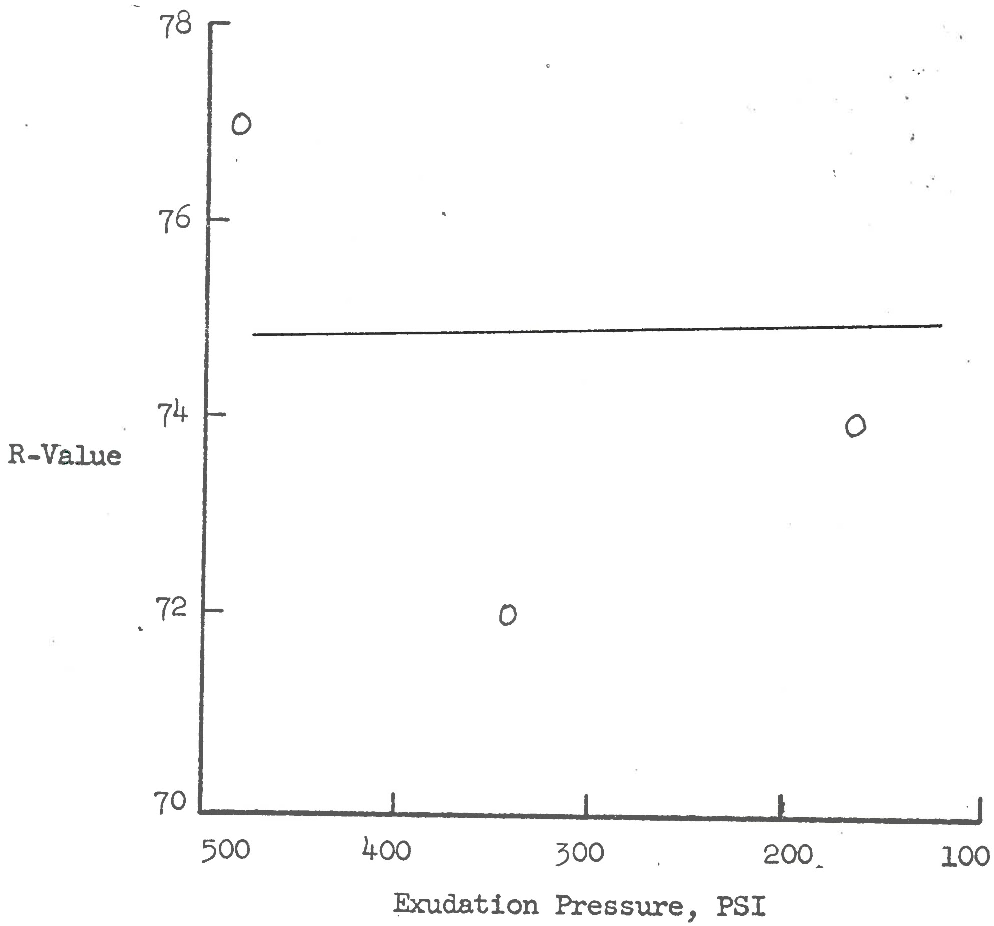




Summary of Data
California R-Value

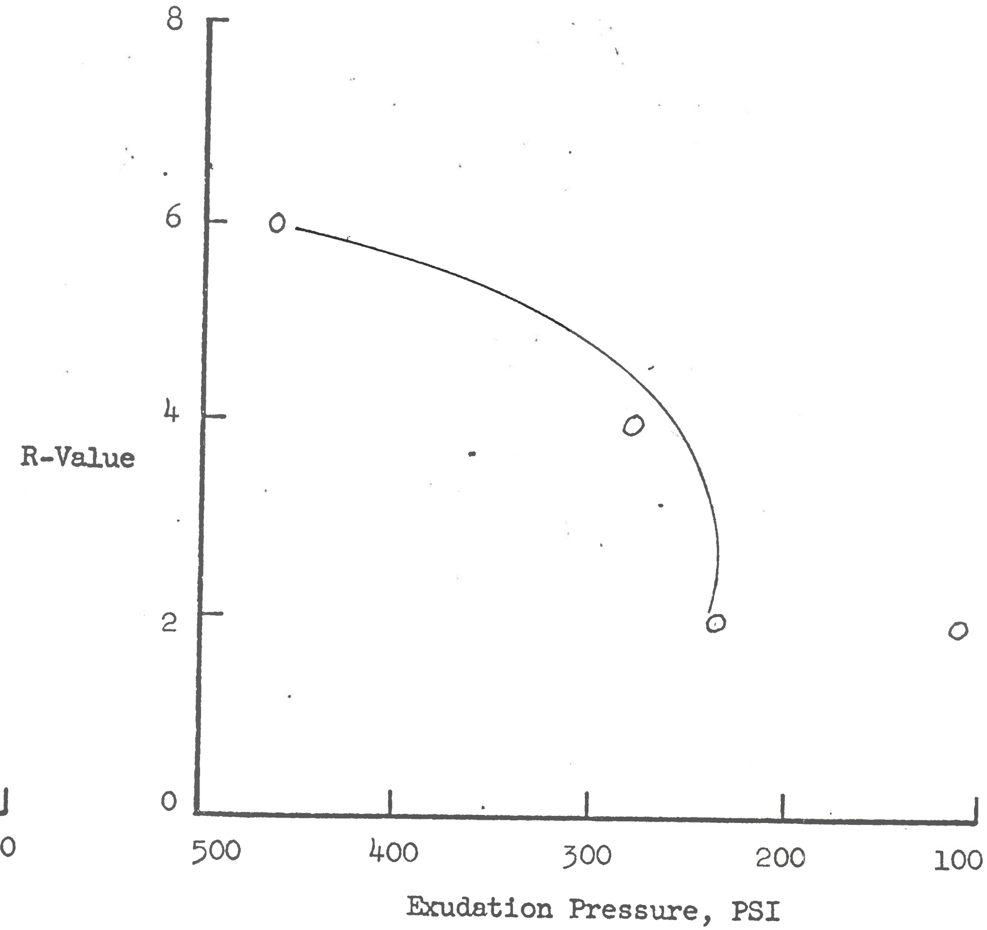
Sample No.: 52
Date Tested: 9-13-65
Visual Description: Tan Sand

R-Value at 240 PSI: 75
R-Value at 300 PSI: 75



Sample No.: 53
Date Tested: 2-6-66
Visual Description: Brown Sandy Clay

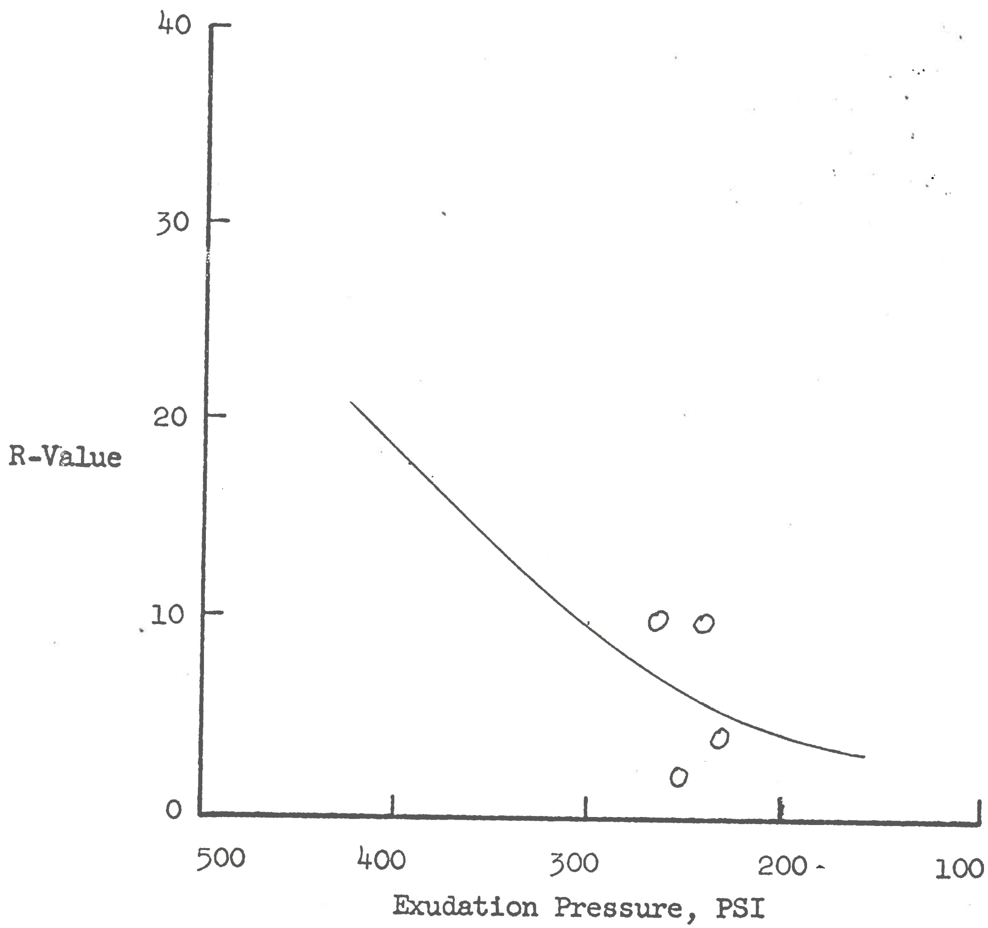
R-Value at 240 PSI: 03
R-Value at 300 PSI: 05



Summary of Data
California R-Value

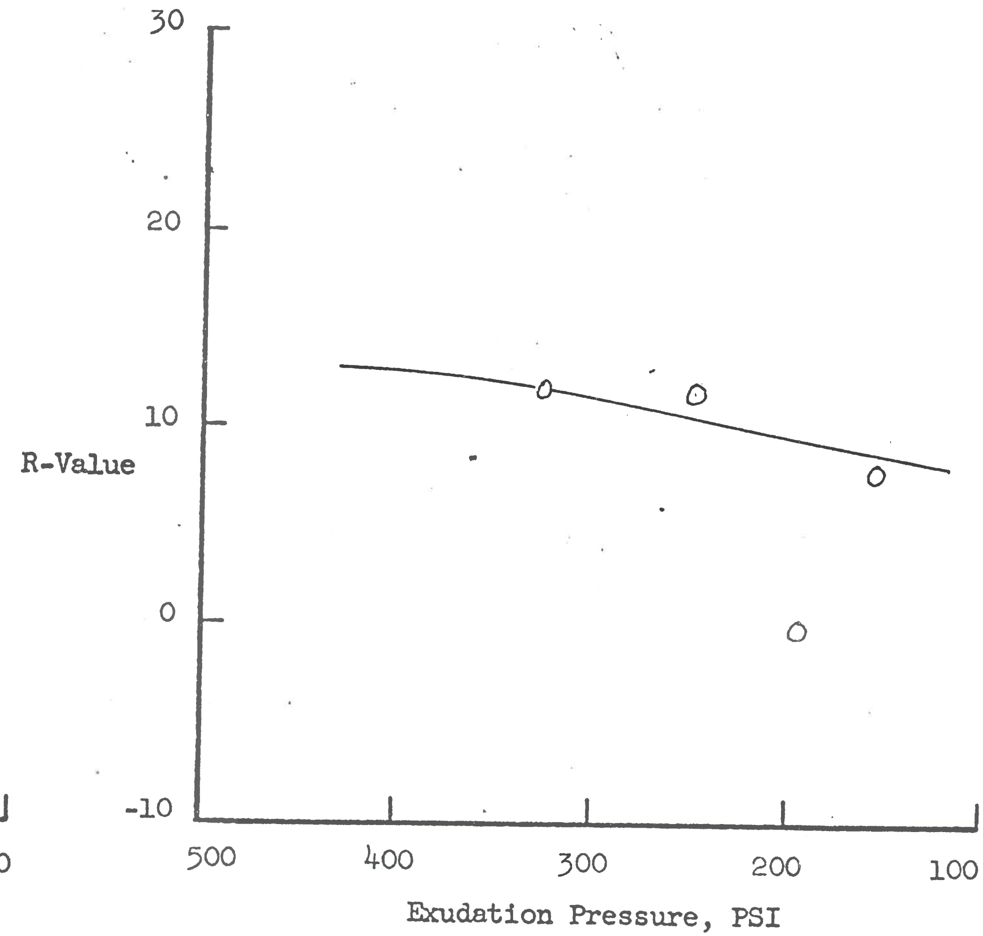
Sample No.: 53
Date Tested: 9-13-65
Visual Description: Brown Sandy Clay

R-Value at 240 PSI: 10
R-Value at 300 PSI: 04



Sample No.: 54
Date Tested: 9-15-65
Visual Description: Tan Sandy Clay

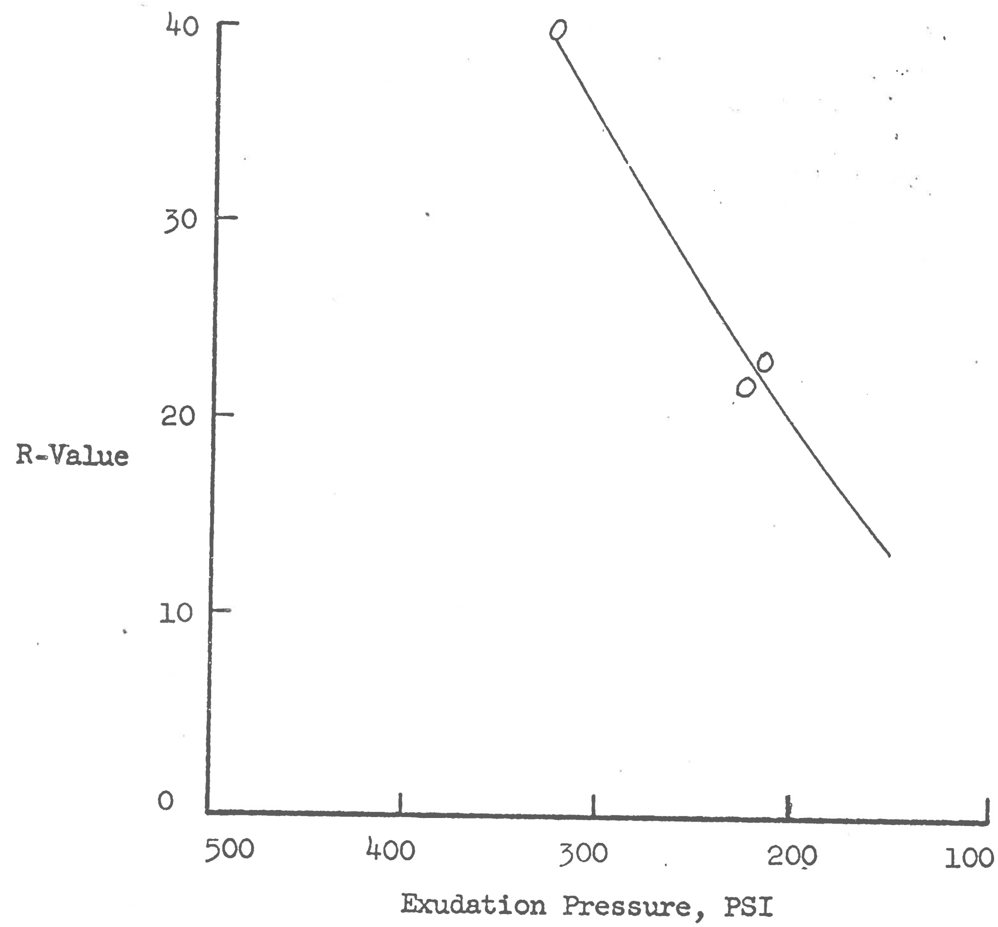
R-Value at 240 PSI: 11
R-Value at 300 PSI: 12



Summary of Data
California R-Value

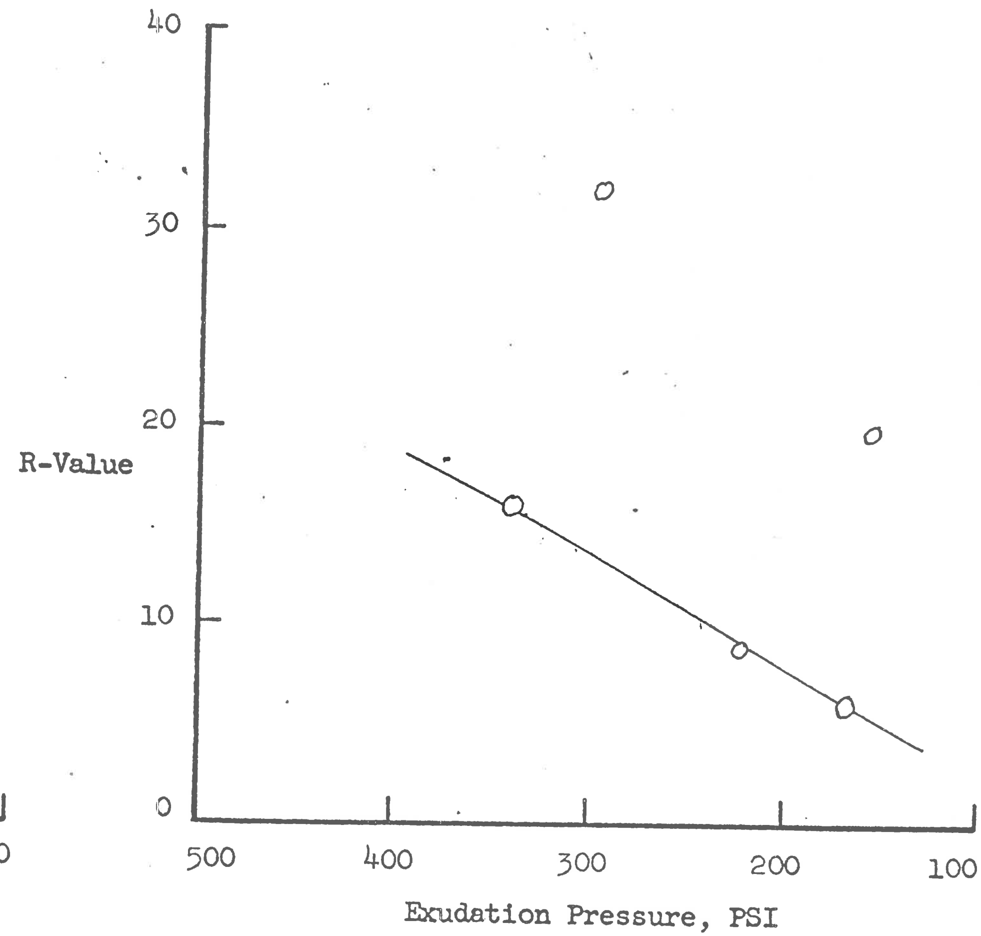
Sample No.: 55
Date Tested: 9-19-65
Visual Description: Red Sand with Clay

R-Value at 240 PSI: 27
R-Value at 300 PSI: 35



Sample No.: 56
Date Tested: 9-14-65
Visual Description: Red Clay

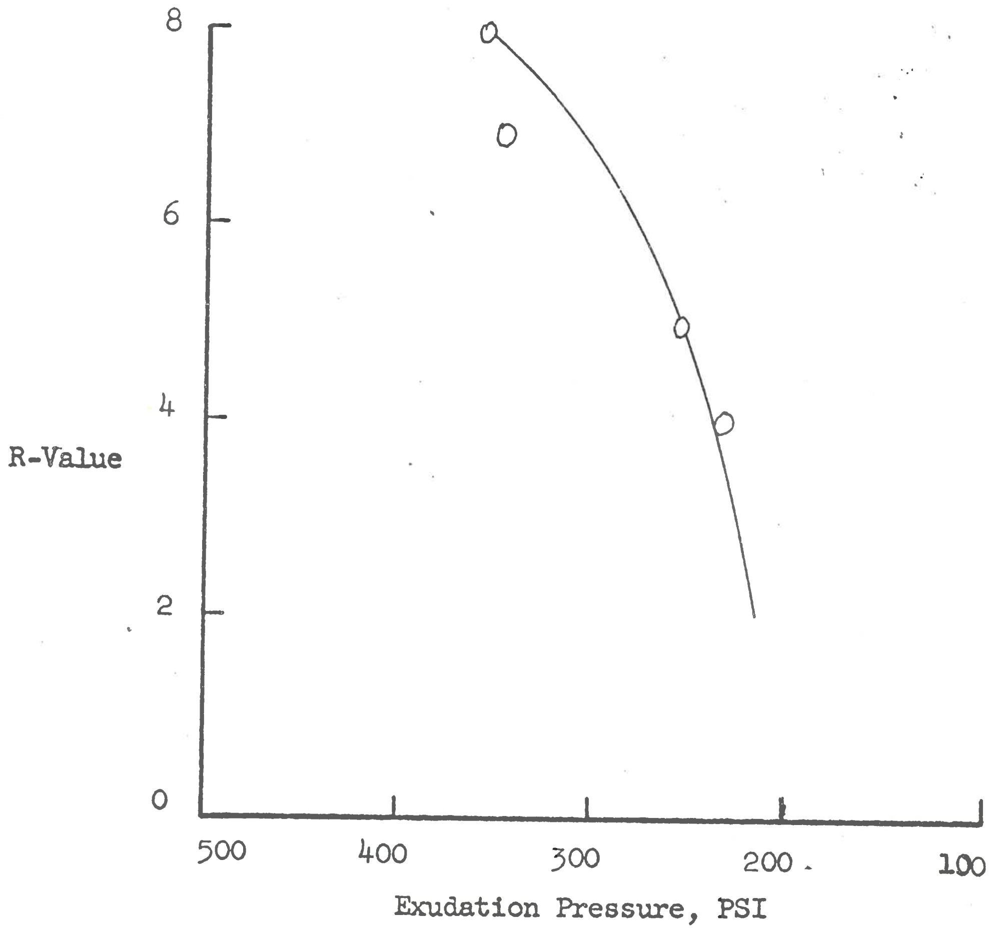
R-Value at 240 PSI: 10
R-Value at 300 PSI: 13



Summary of Data
California R-Value

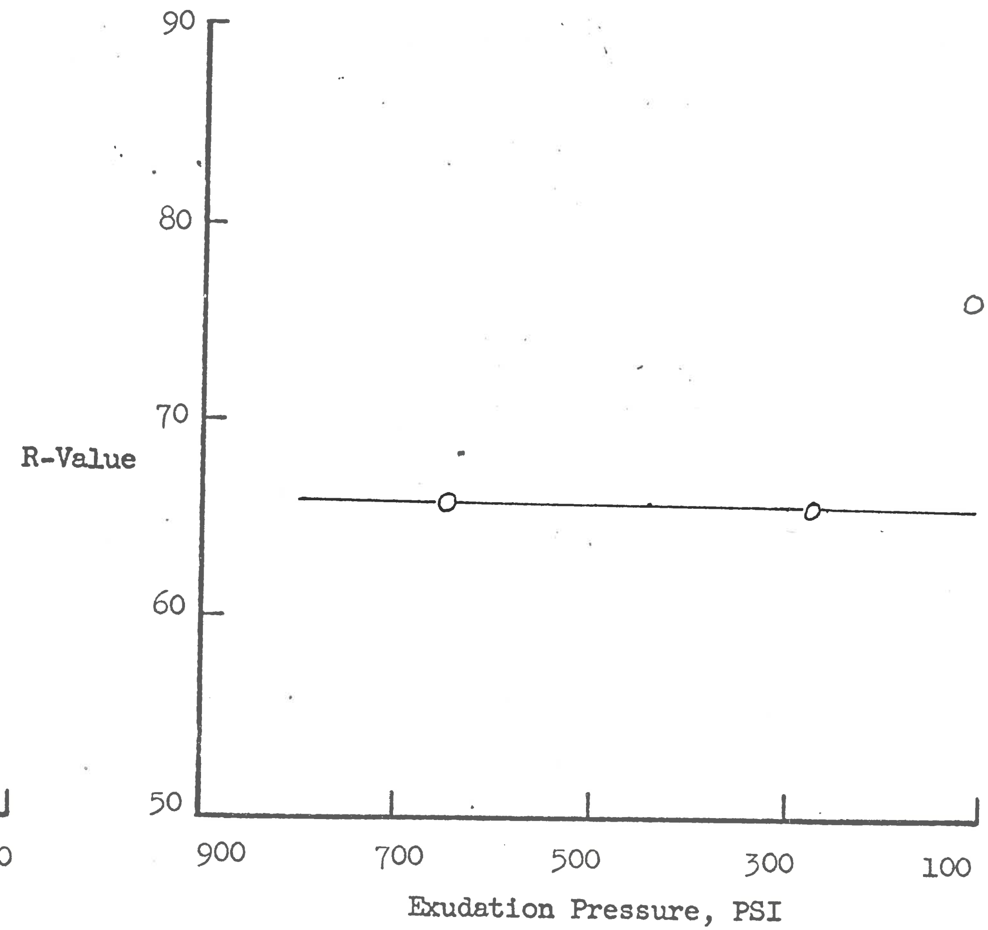
Sample No.: 57
Date Tested: 9-15-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 04
R-Value at 300 PSI: 07



Sample No.: 58
Date Tested: 9-14-65
Visual Description: Brown Sand

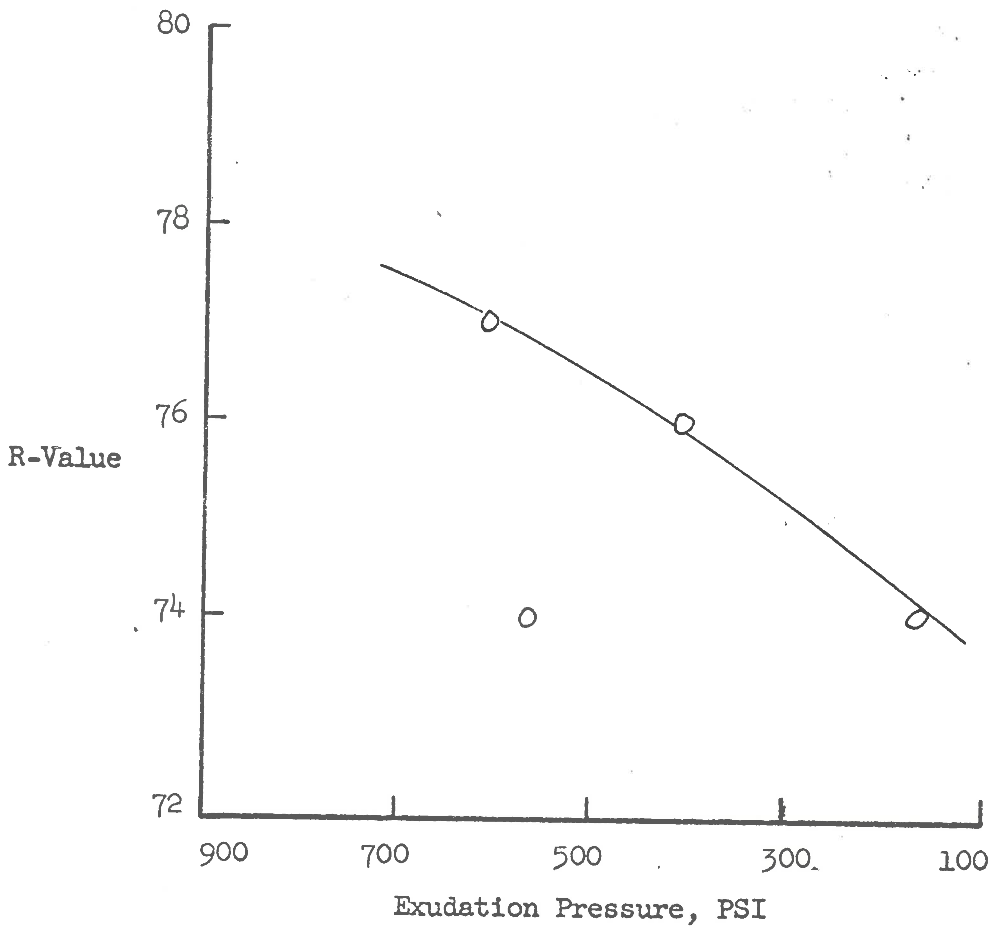
R-Value at 240 PSI: 66
R-Value at 300 PSI: 66



Summary of Data
California R-Value

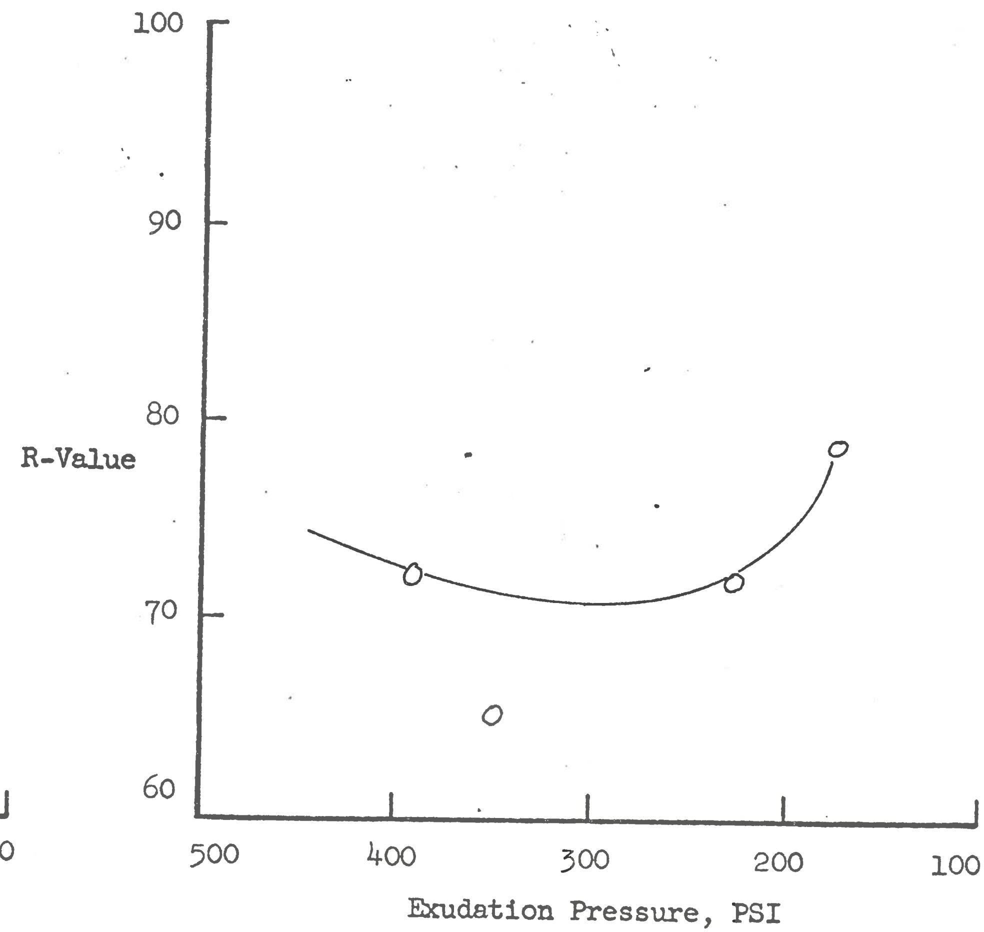
Sample No.: 59
Date Tested: 9-21-65
Visual Description: Brown Sand

R-Value at 240 PSI: 75
R-Value at 300 PSI: 75



Sample No.: 60
Date Tested: 9-21-65
Visual Description: Red Sand

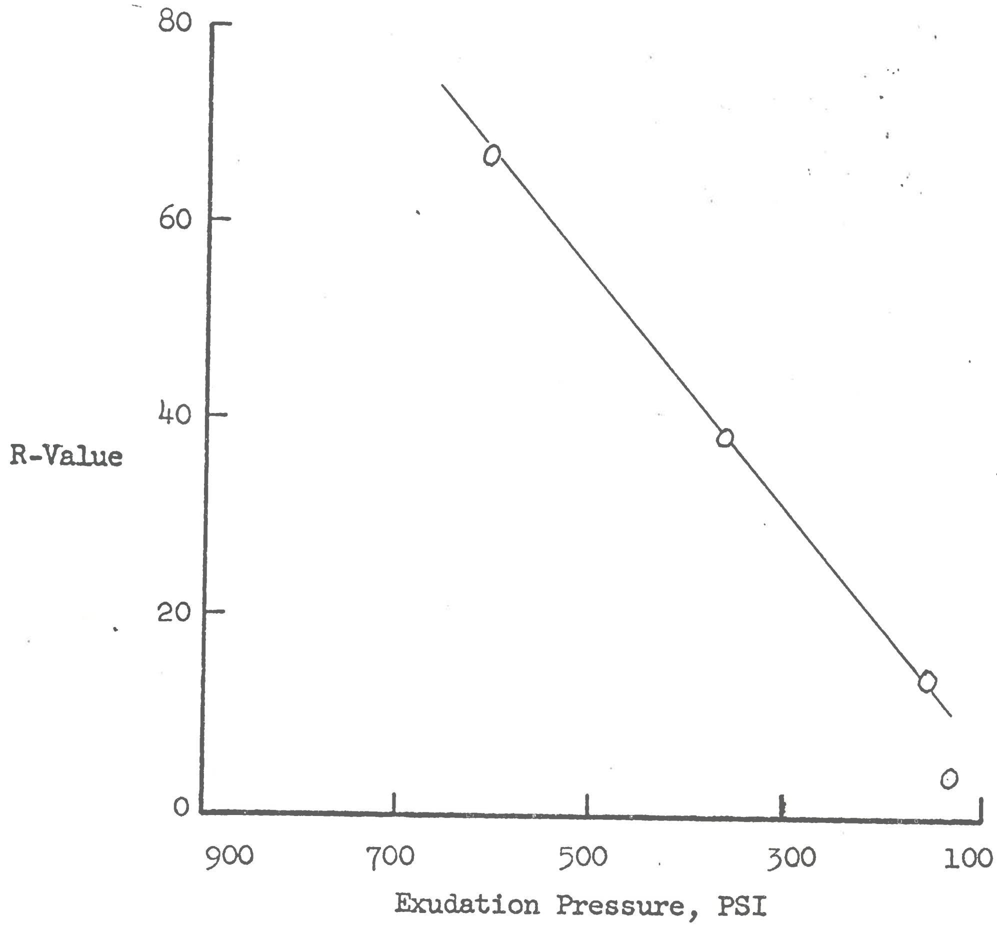
R-Value at 240 PSI: 71
R-Value at 300 PSI: 71



Summary of Data
California R-Value

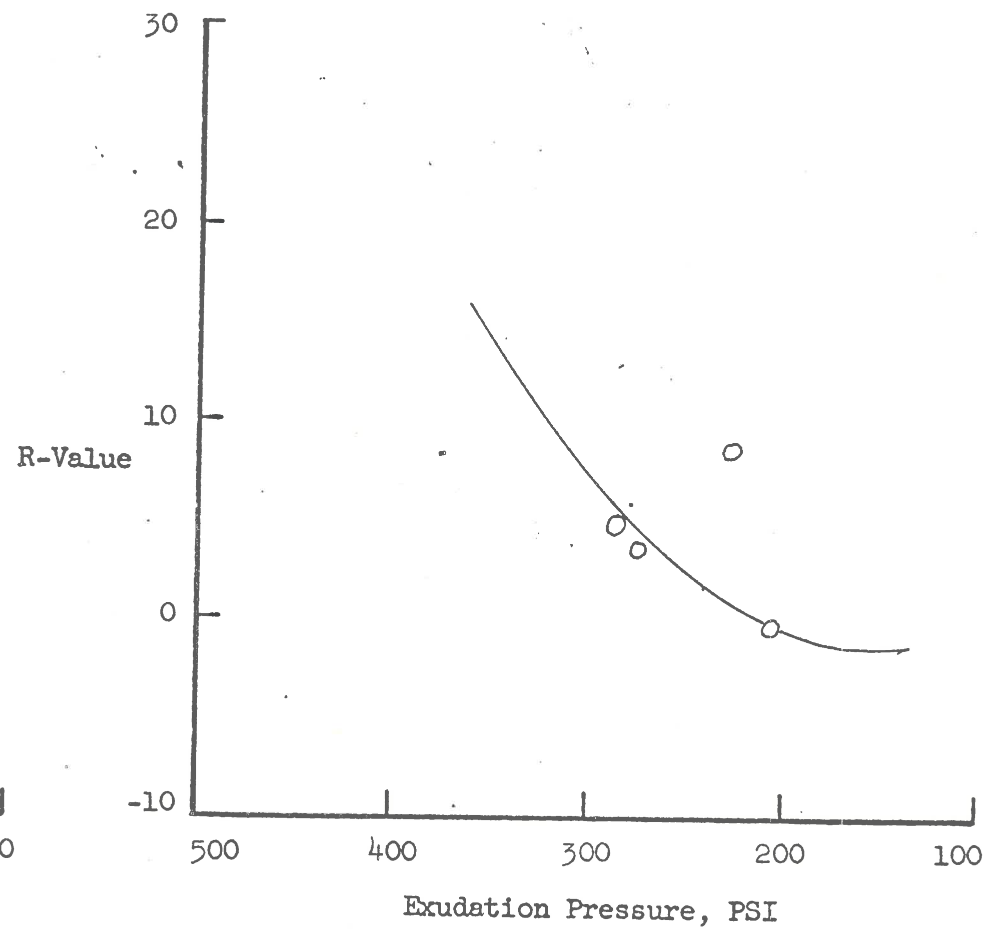
Sample No.: 61
Date Tested: 9-14-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 25
R-Value at 300 PSI: 32



Sample No.: 62
Date Tested: 9-14-65
Visual Description: Tan Silty Clay

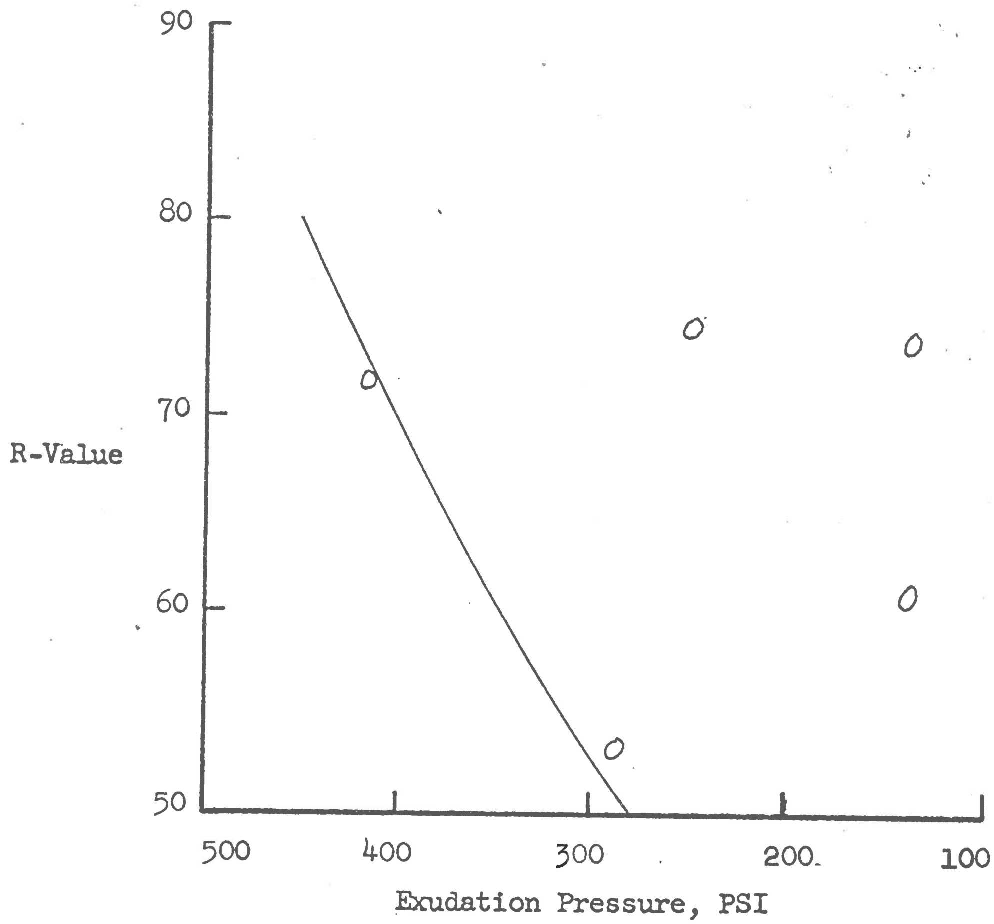
R-Value at 240 PSI: 02
R-Value at 300 PSI: 08



Summary of Data
California R-Value

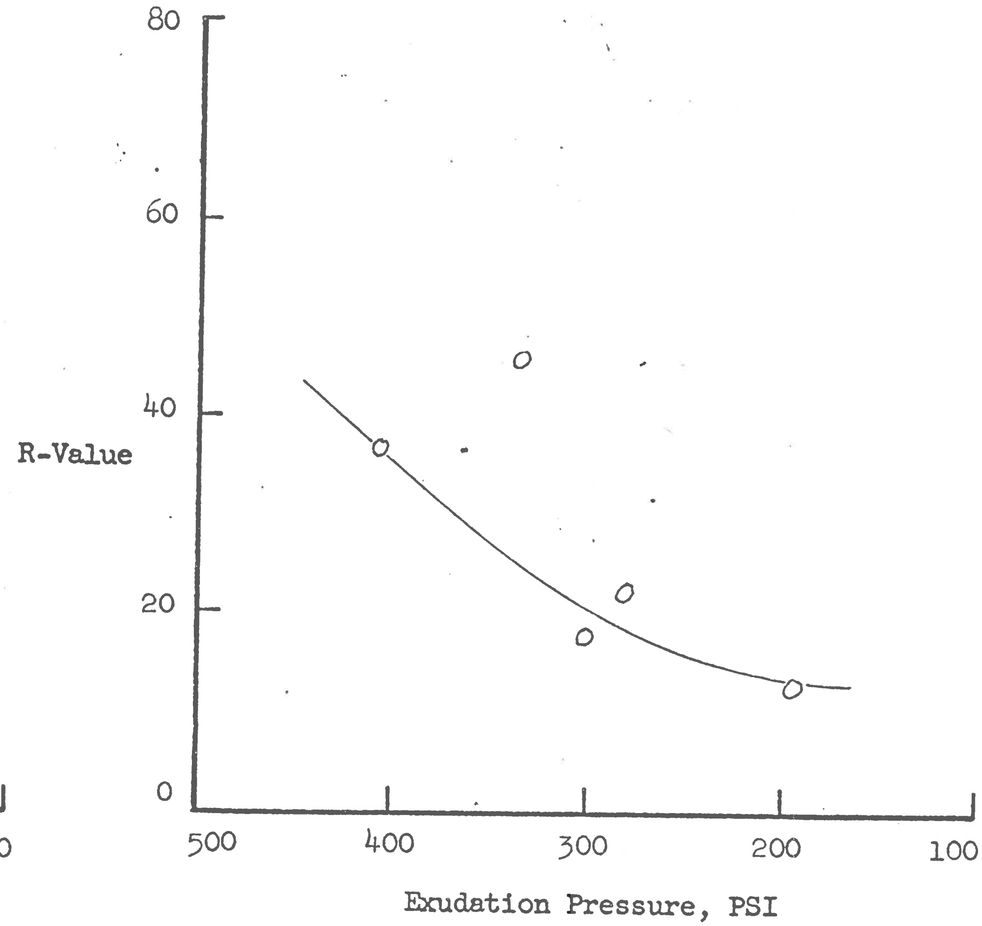
Sample No.: 63
Date Tested: 9-21-65
Visual Description: Sandy Silt

R-Value at 240 PSI: 35
R-Value at 300 PSI: 52



Sample No.: 64
Date Tested: 9-21-65
Visual Description: Tan Silty Clay

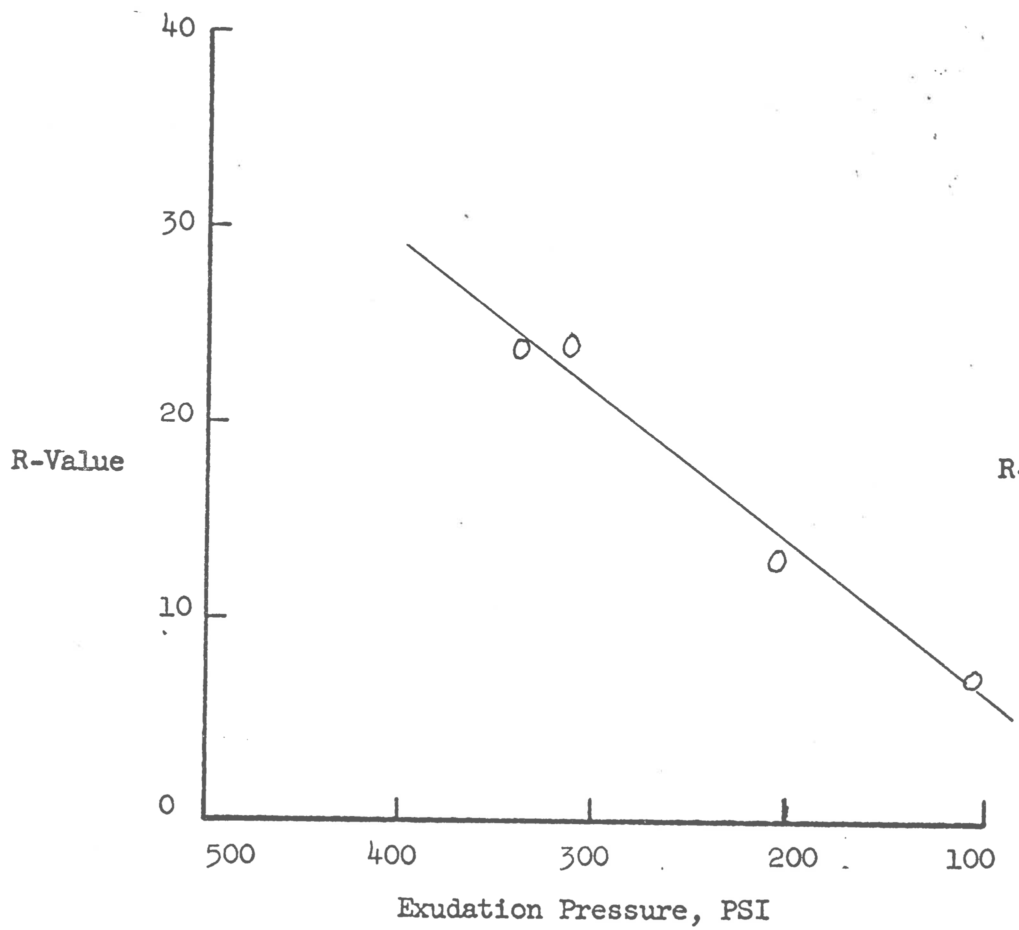
R-Value at 240 PSI: 17
R-Value at 300 PSI: 21



Summary of Data
California R-Value

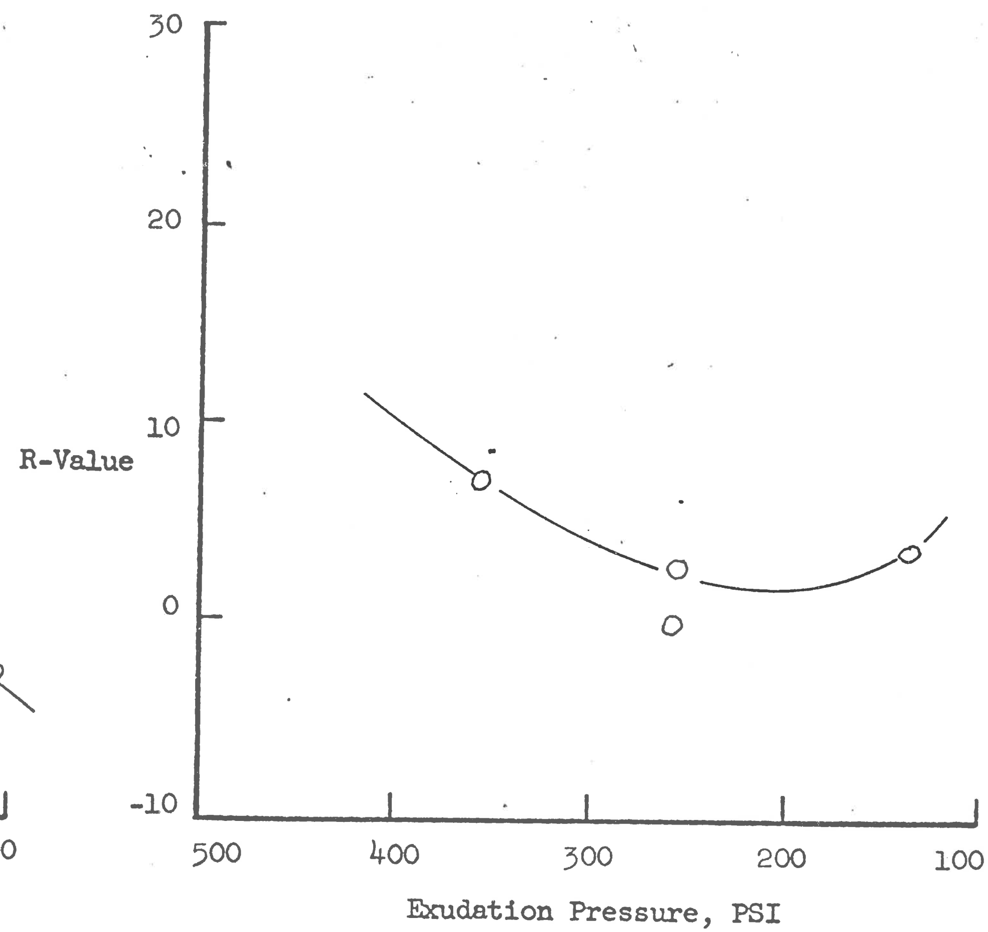
Sample No.: 65
Date Tested: 9-28-65
Visual Description: Tan Clayey Sand

R-Value at 240 PSI: 17
R-Value at 300 PSI: 20



Sample No.: 66
Date Tested: 9-21-65
Visual Description: Tan Clay

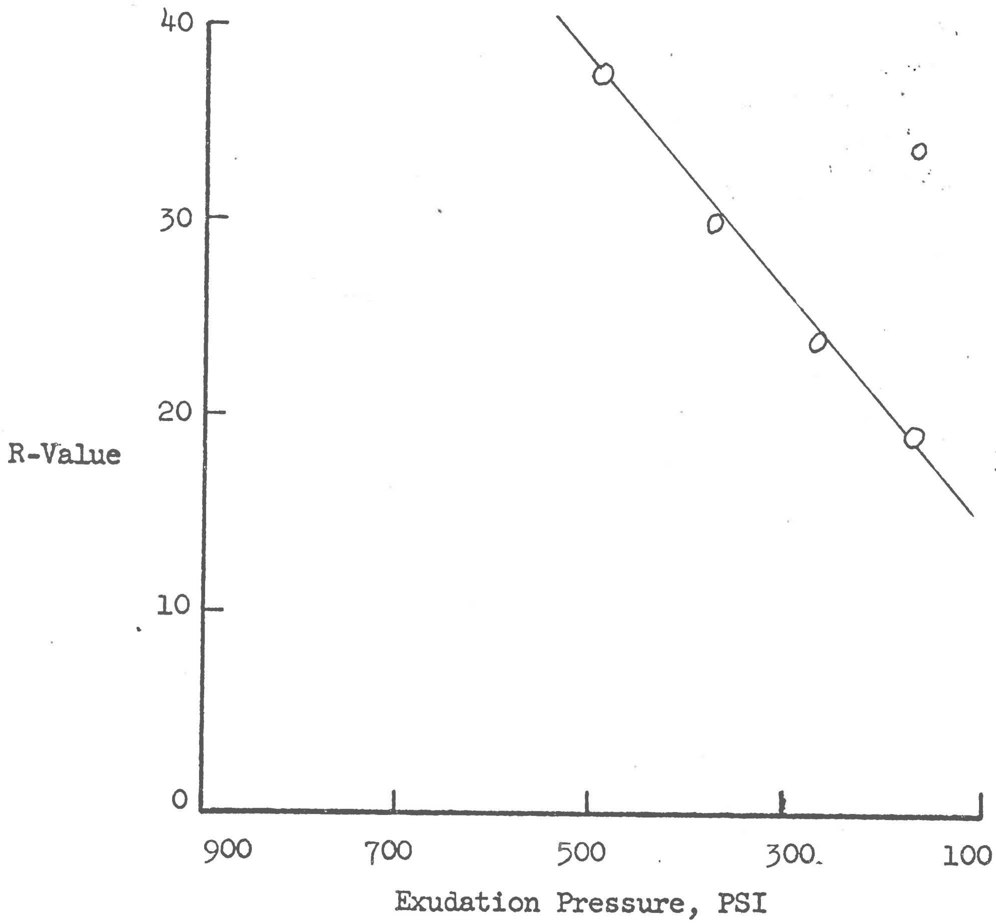
R-Value at 240 PSI: 03
R-Value at 300 PSI: 05



Summary of Data
California R-Value

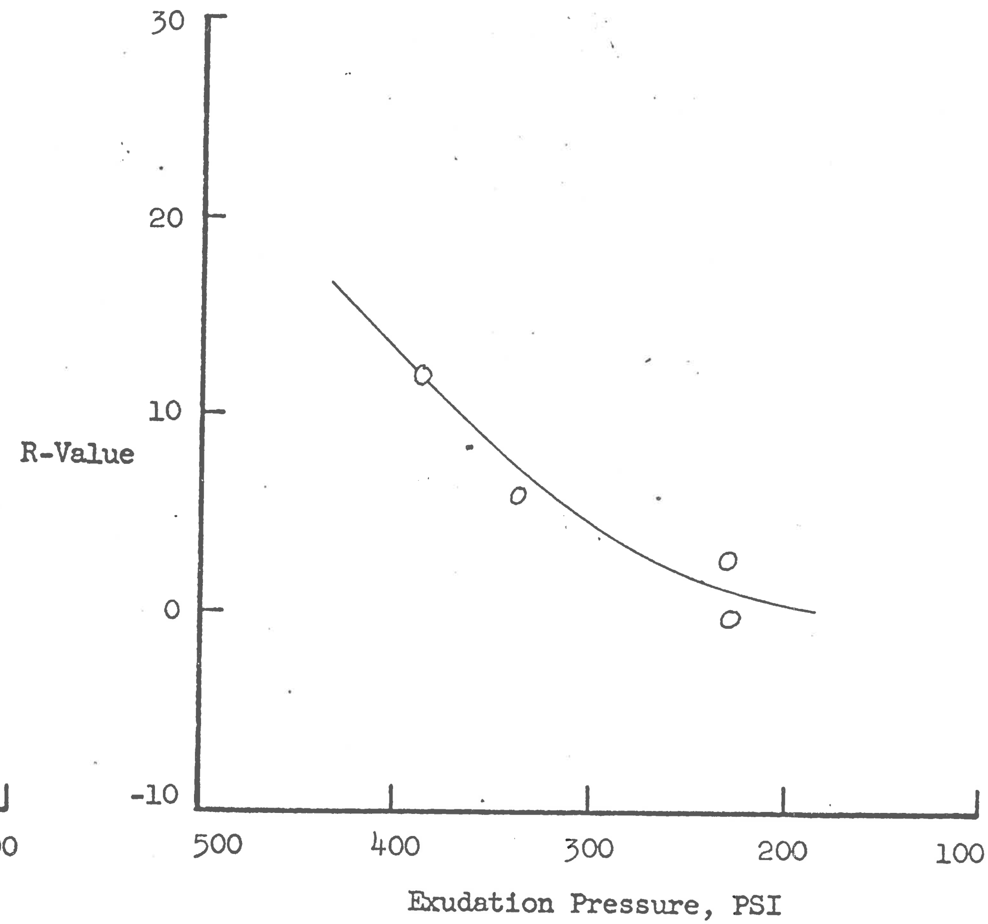
Sample No.: 67
Date Tested: 9-20-65
Visual Description: Tan Clayey Sand

R-Value at 240 PSI: 22
R-Value at 300 PSI: 27



Sample No.: 68
Date Tested: 9-20-65
Visual Description: Tan Clay

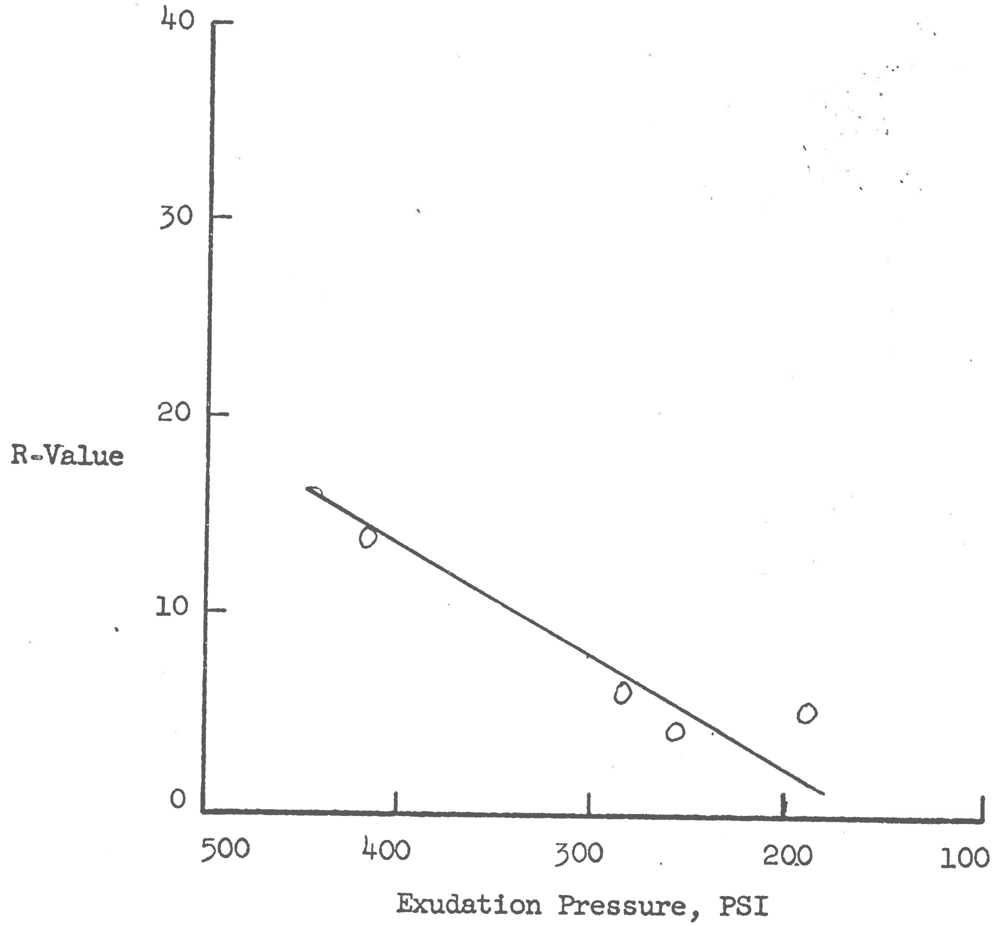
R-Value at 240 PSI: 02
R-Value at 300 PSI: 05



Summary of Data
California R-Value

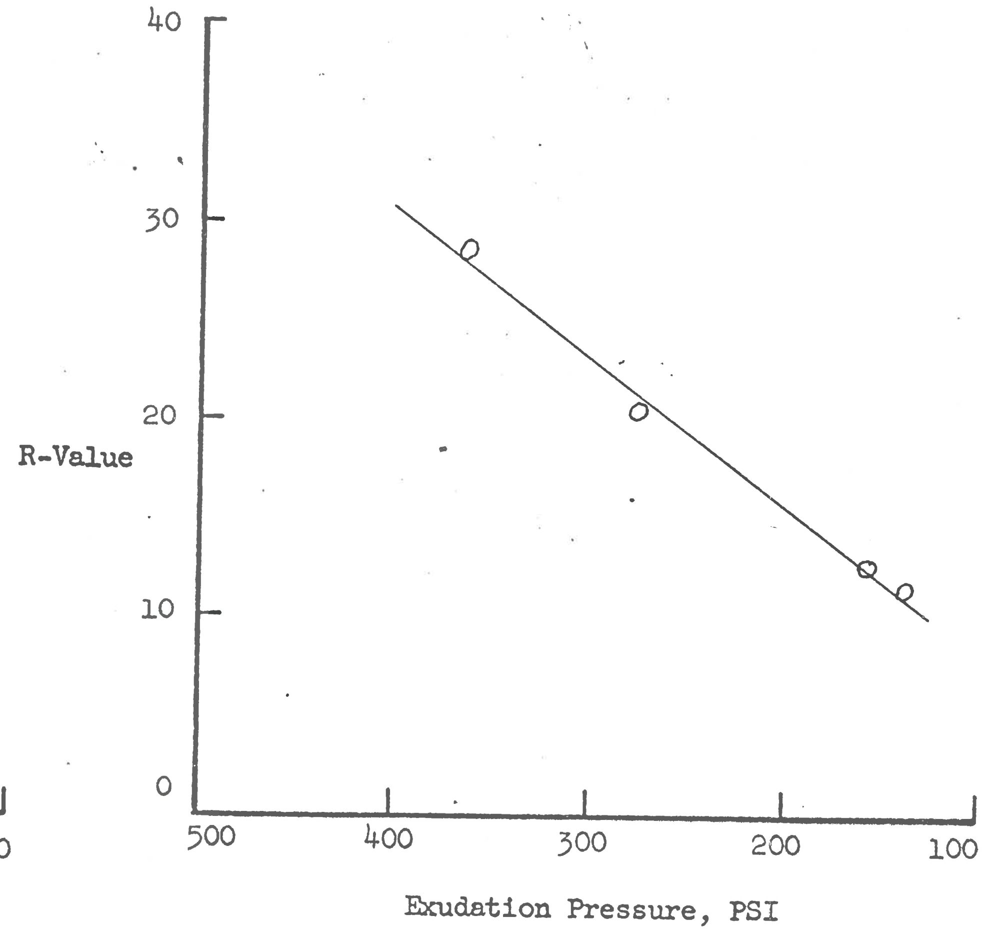
Sample No.: 69
Date Tested: 9-20-65
Visual Description: Brownish Gray Clay

R-Value at 240 PSI: 08
R-Value at 300 PSI: 04



Sample No.: 70
Date Tested: 9-20-65
Visual Description: Tan Clayey Sand

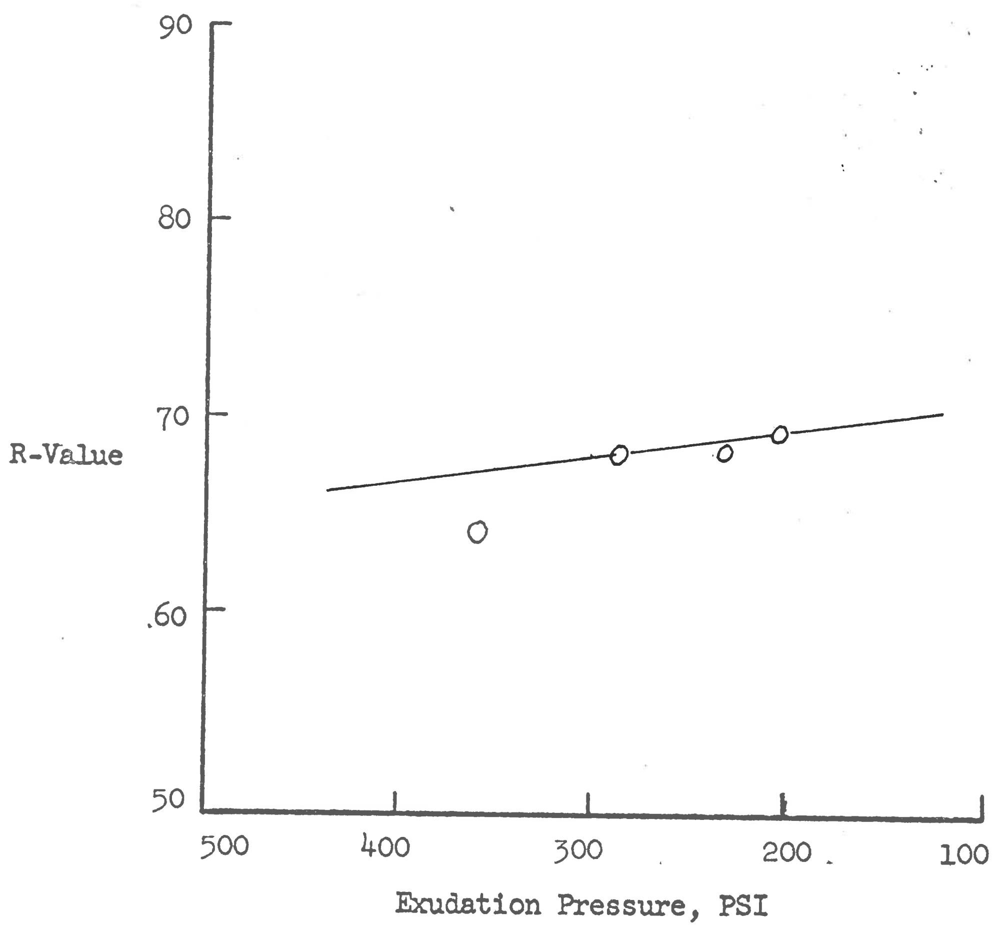
R-Value at 240 PSI: 19
R-Value at 300 PSI: 23



Summary of Data
California R-Value

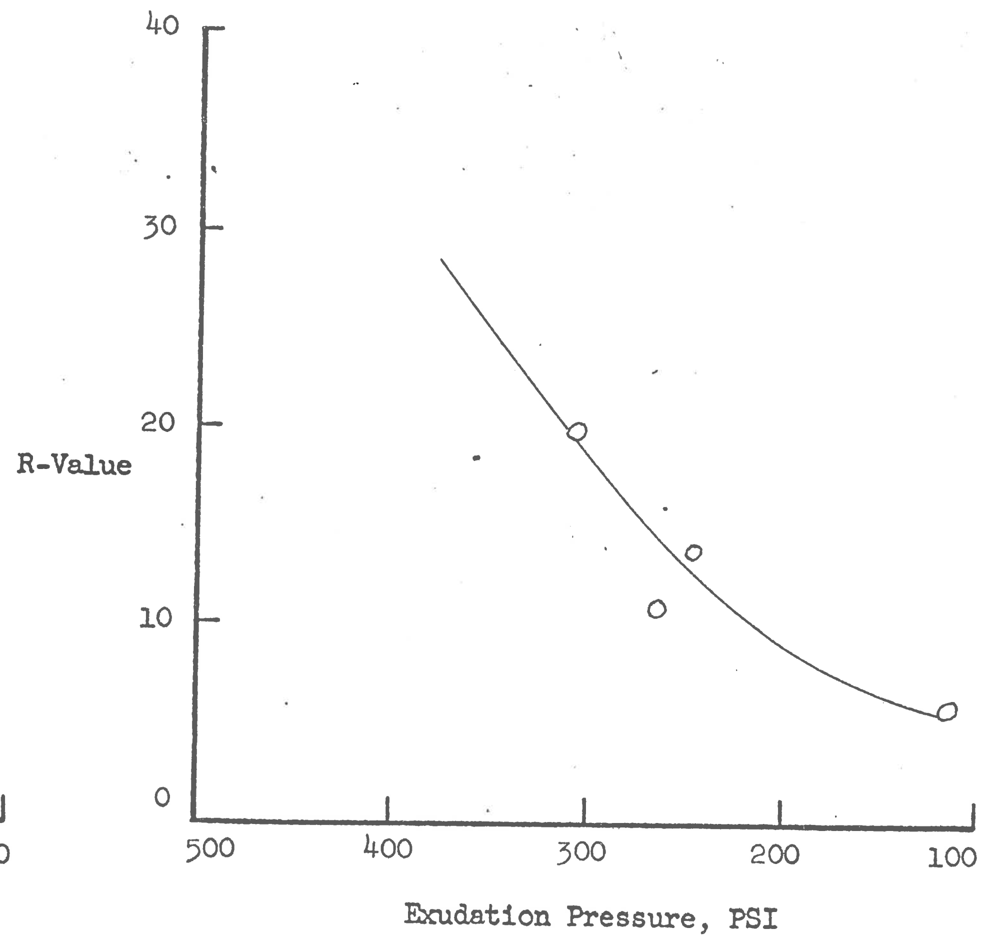
Sample No.: 71
Date Tested: 9-20-65
Visual Description: Red Sand

R-Value at 240 PSI: 68
R-Value at 300 PSI: 68



Sample No.: 72
Date Tested: 9-20-65
Visual Description: Red Clayey Sand

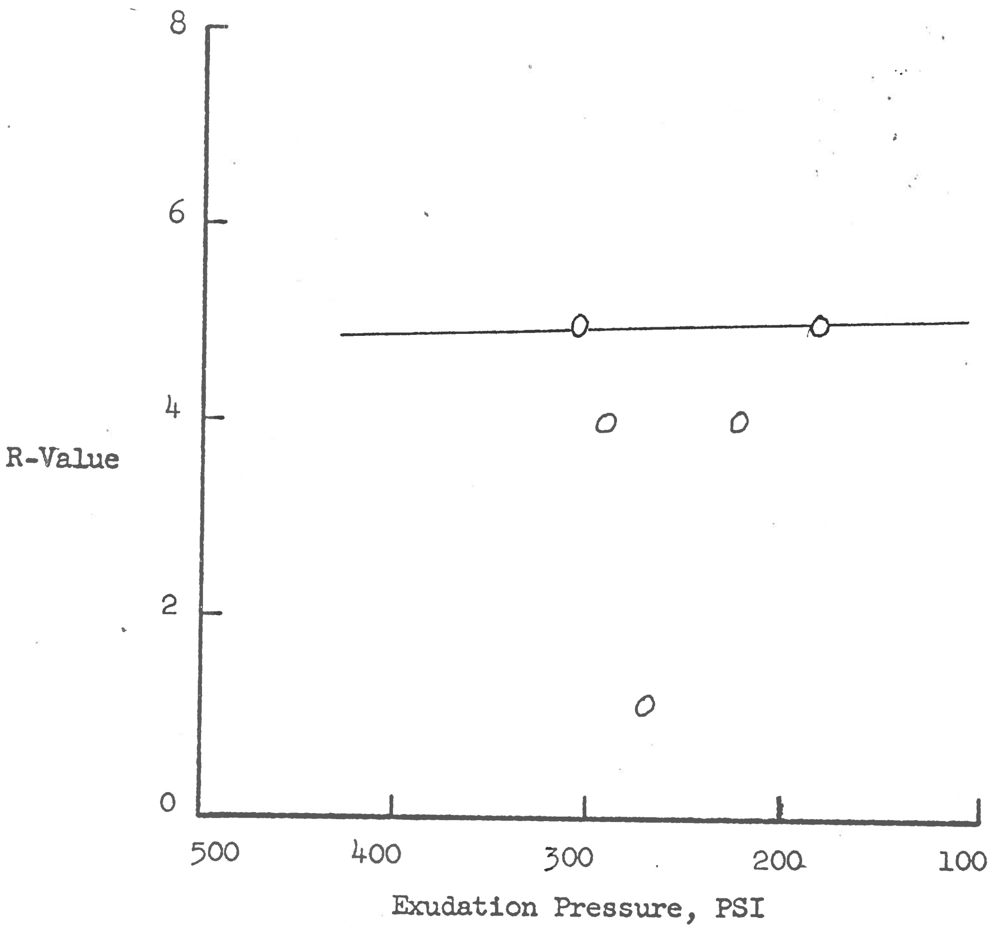
R-Value at 240 PSI: 12
R-Value at 300 PSI: 20



Summary of Data
California R-Value

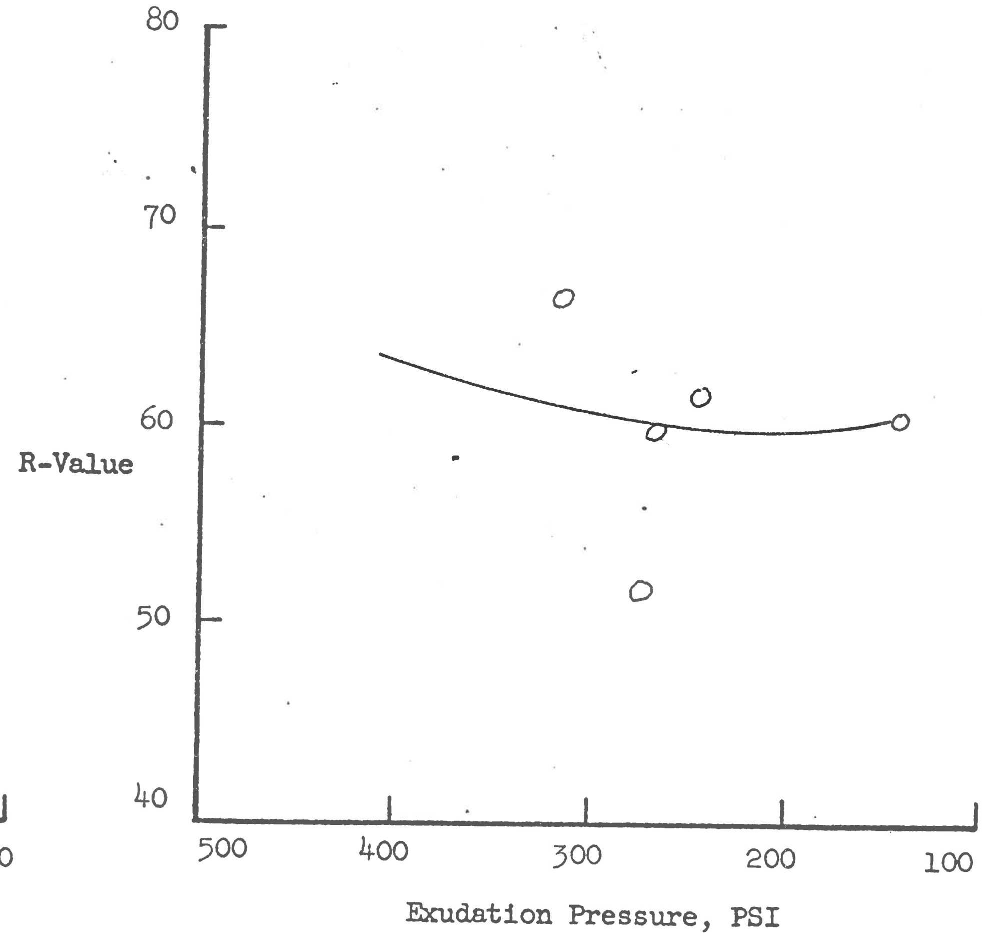
Sample No.: 73
Date Tested: 9-20-65
Visual Description: Brownish Silty Clay

R-Value at 240 PSI: 05
R-Value at 300 PSI: 05



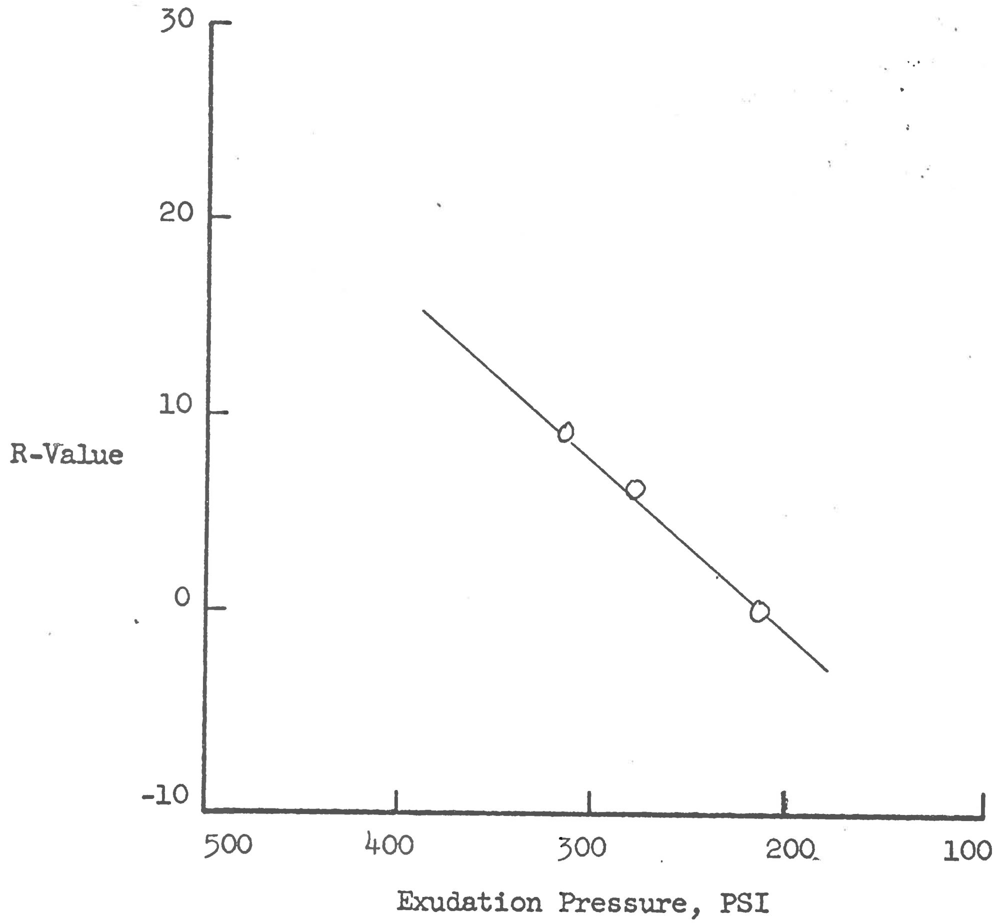
Sample No.: 74
Date Tested: 9-23-65
Visual Description: Tan Sand

R-Value at 240 PSI: 61
R-Value at 300 PSI: 61

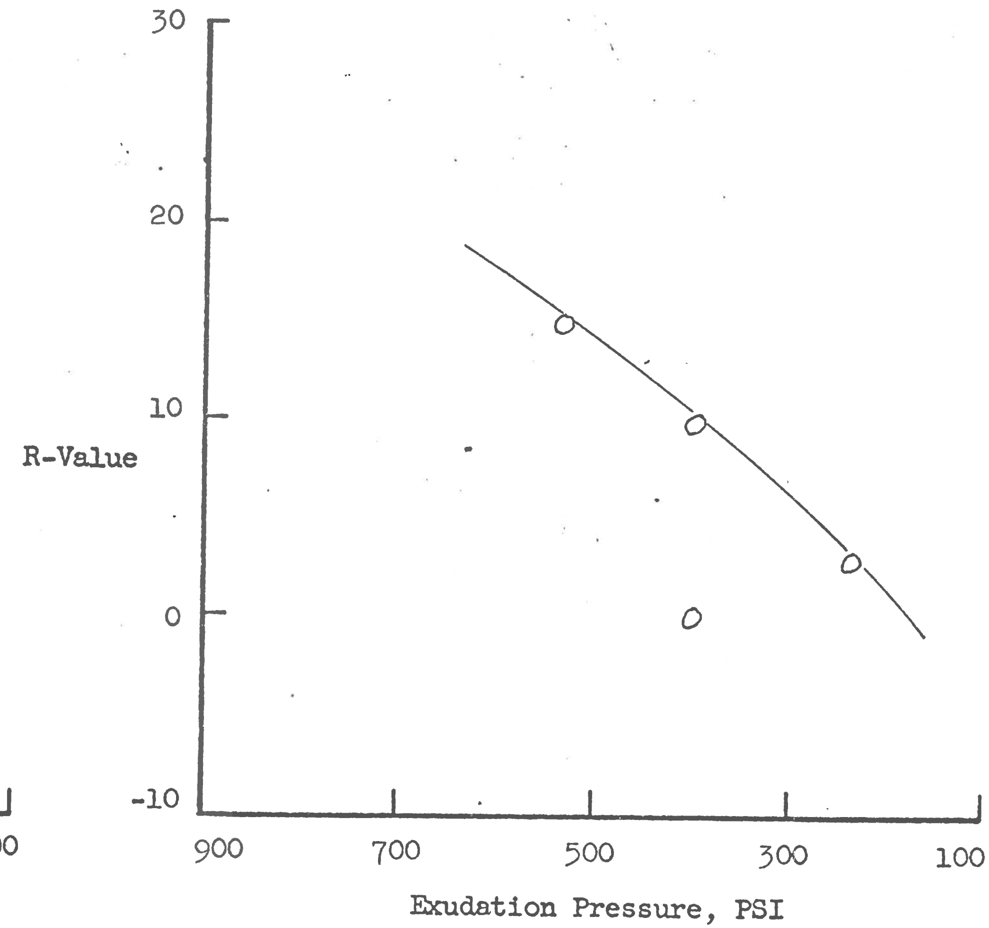


Summary of Data
California R-Value

Sample No.:	75
Date Tested:	9-23-65
Visual Description:	Brown Silty Clay
R-Value at 240 PSI:	02
R-Value at 300 PSI:	08



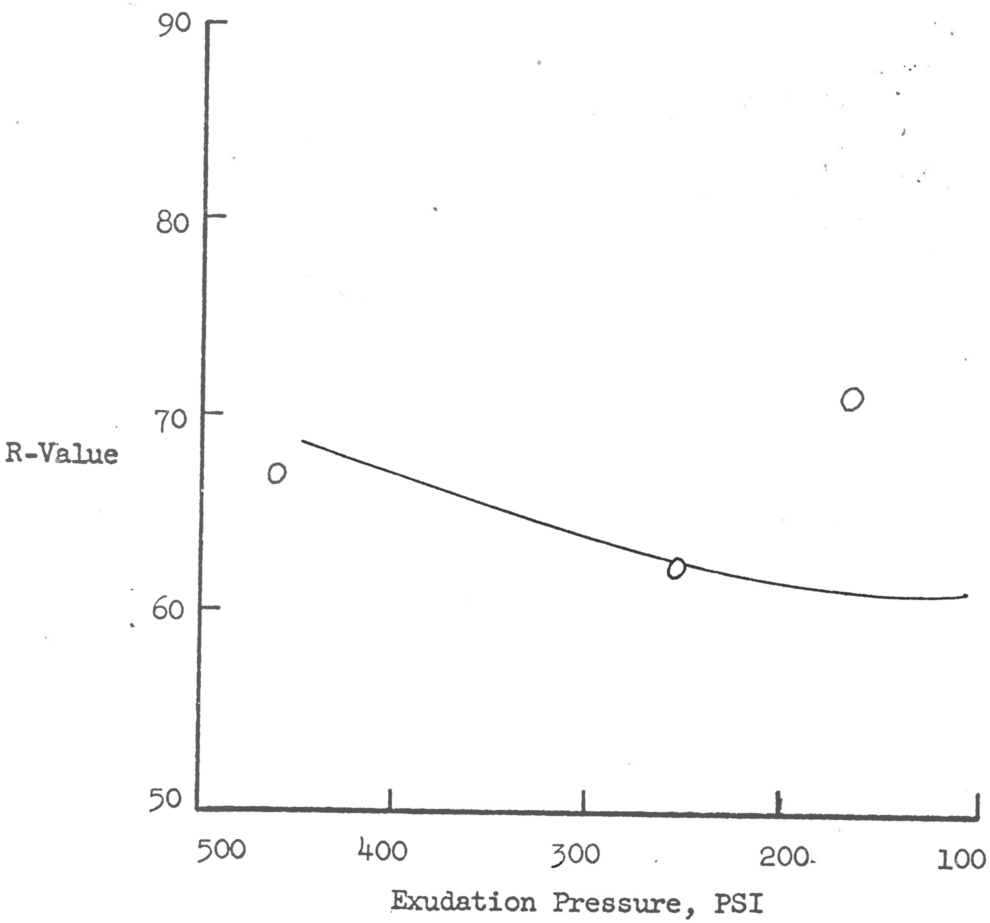
Sample No.:	76
Date Tested:	9-29-65
Visual Description:	Brown Clay
R-Value at 240 PSI:	03
R-Value at 300 PSI:	07



Summary of Data
California R-Value

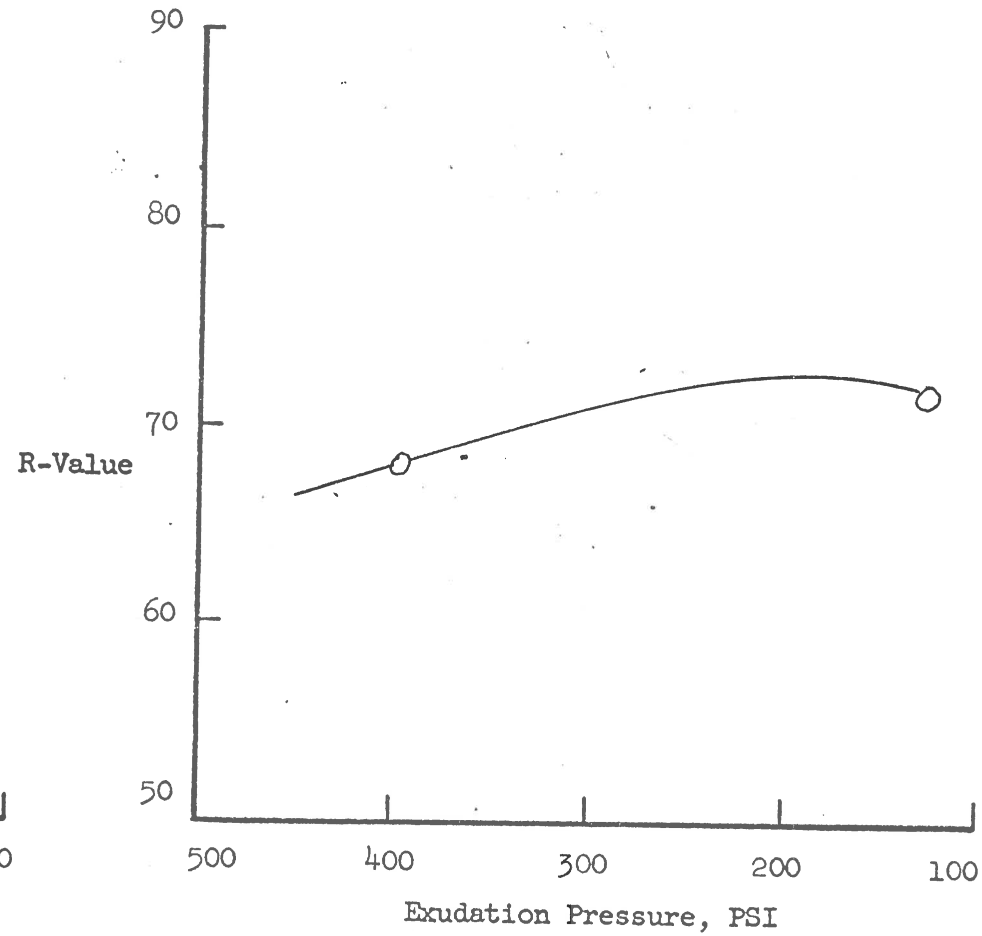
Sample No.: 77
Date Tested: 9-28-65
Visual Description: Red Silt

R-Value at 240 PSI: 62
R-Value at 300 PSI: 64



Sample No.: 78
Date Tested: 9-28-65
Visual Description: Clay-Sand

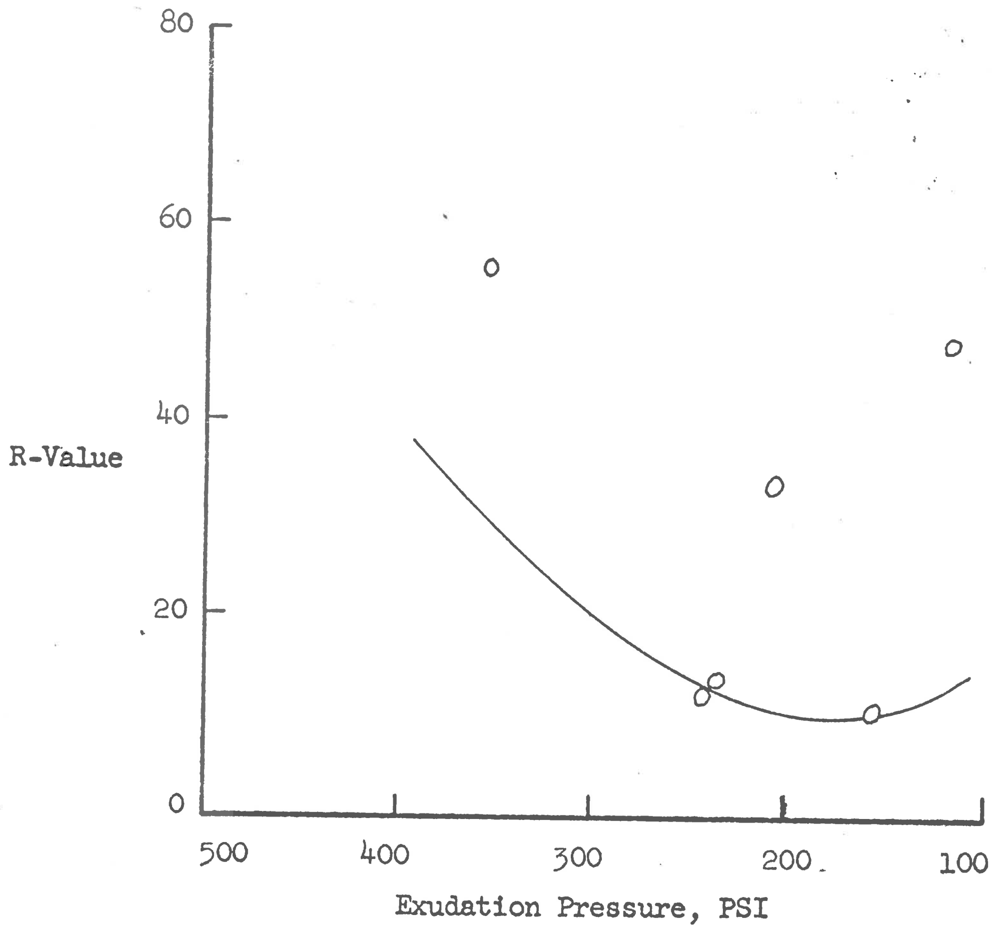
R-Value at 240 PSI: 72
R-Value at 300 PSI: 72



Summary of Data
California R-Value

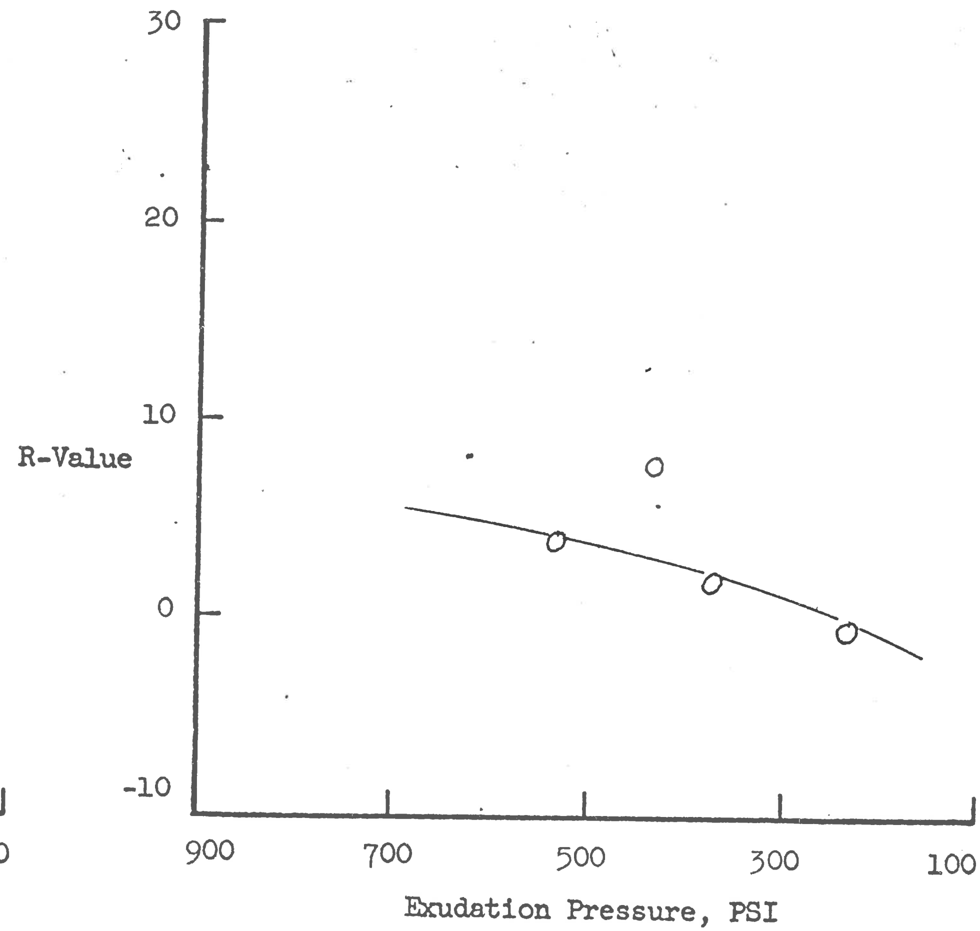
Sample No.: 79
Date Tested: 9-27-65
Visual Description: Red Clayey Silt

R-Value at 240 PSI: 13
R-Value at 300 PSI: 20



Sample No.: 80
Date Tested: 10-5-65
Visual Description: Reddish Brown Clay

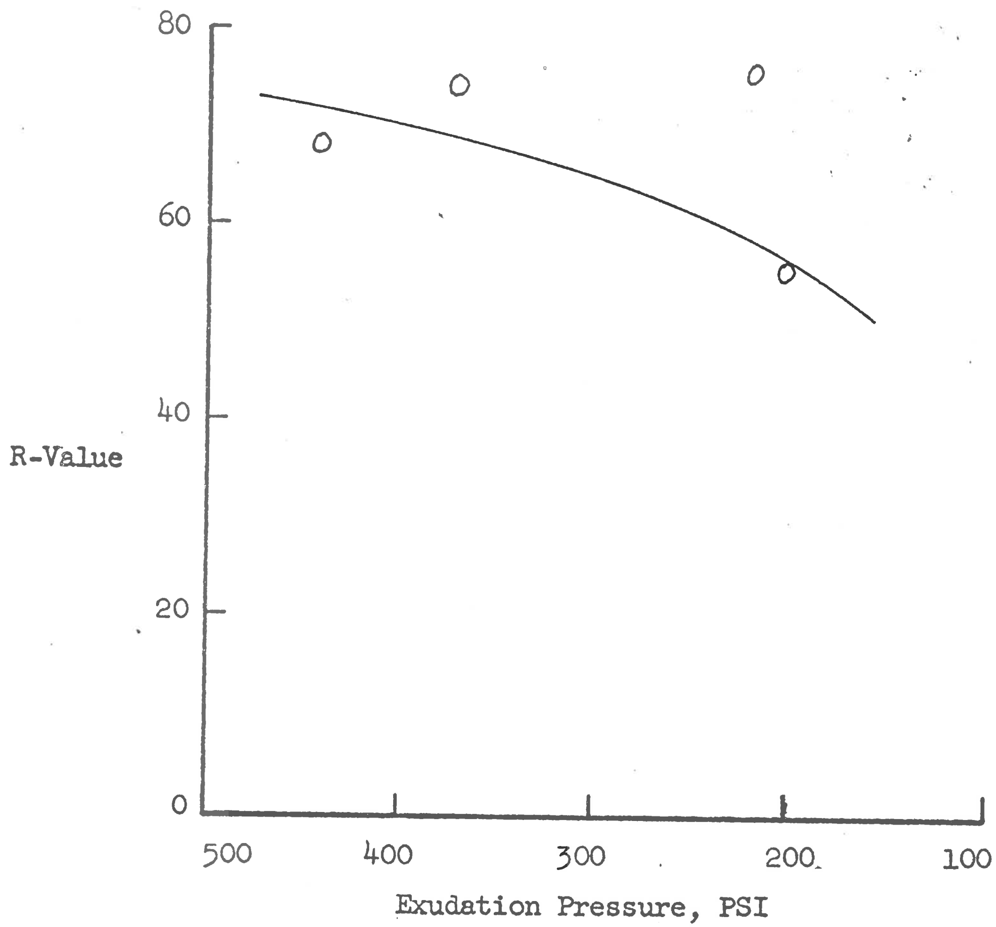
R-Value at 240 PSI: 01
R-Value at 300 PSI: 02



Summary of Data
California R-Value

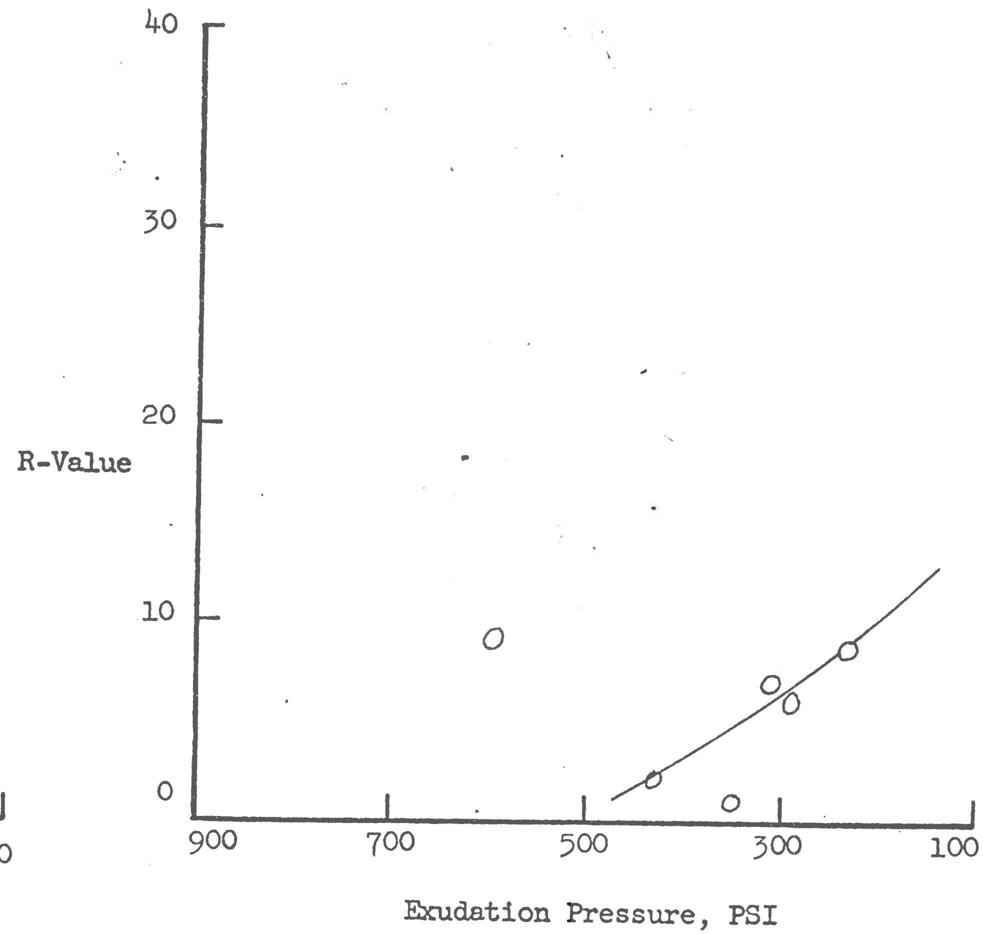
Sample No.: 81
Date Tested: 10-5-65
Visual Description: Brown Silty Sand

R-Value at 240 PSI: 61
R-Value at 300 PSI: 65



Sample No.: 82
Date Tested: 10-5-65
Visual Description: Brown Sandy Clay

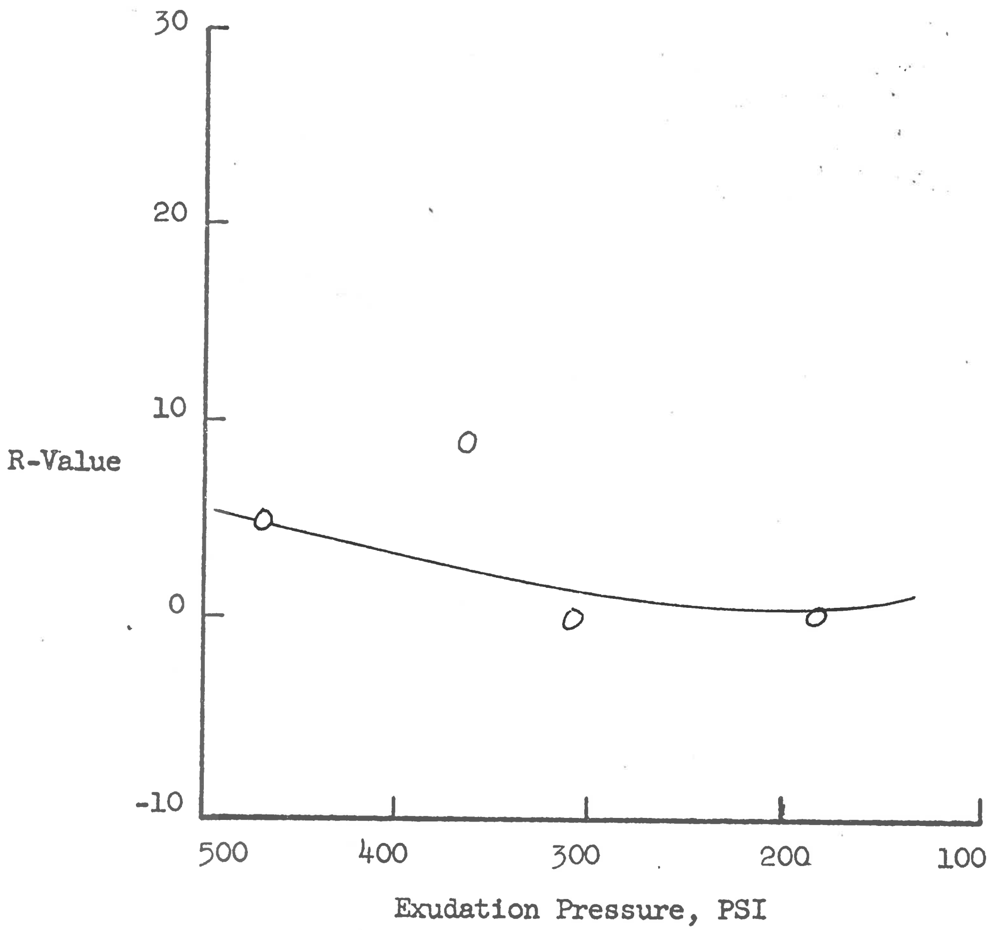
R-Value at 240 PSI: 08
R-Value at 300 PSI: 08



Summary of Data
California R-Value

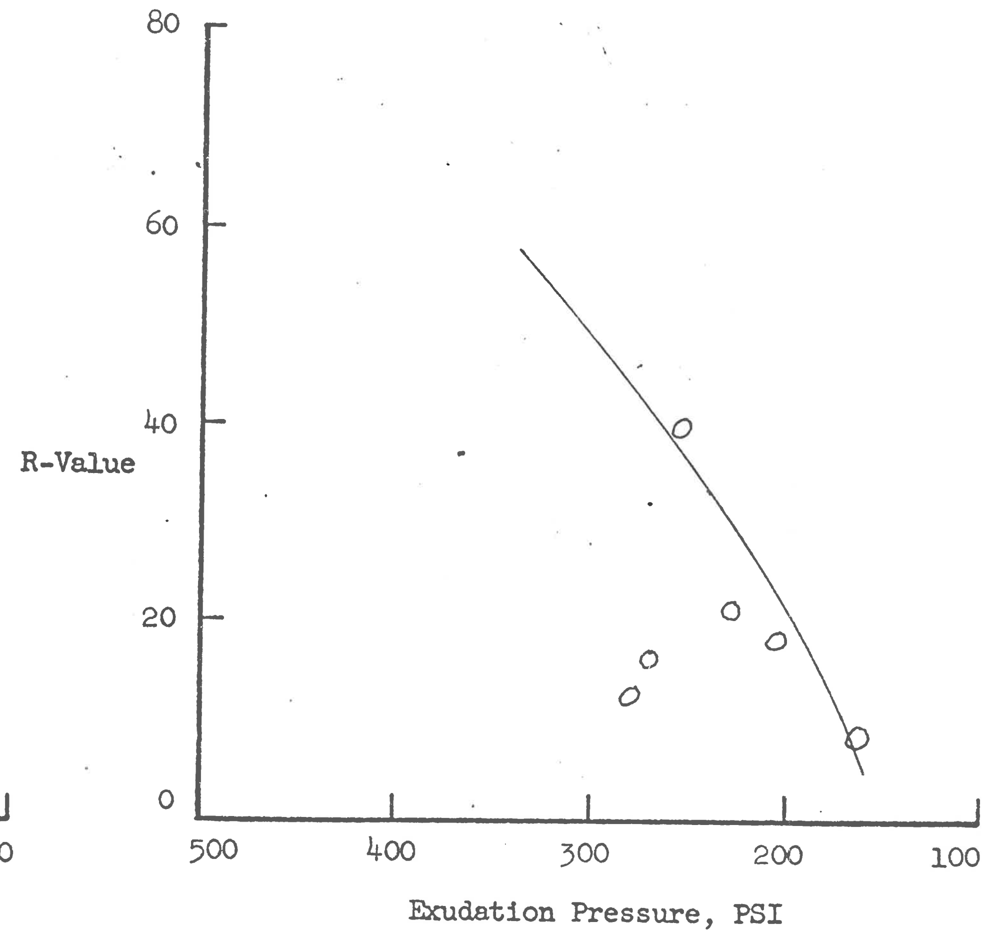
Sample No.: 83
Date Tested: 10-5-65
Visual Description: Tan Silty Clay

R-Value at 240 PSI: 01
R-Value at 300 PSI: 01



Sample No.: 84
Date Tested: 10-5-65
Visual Description: Red Sandy Clay

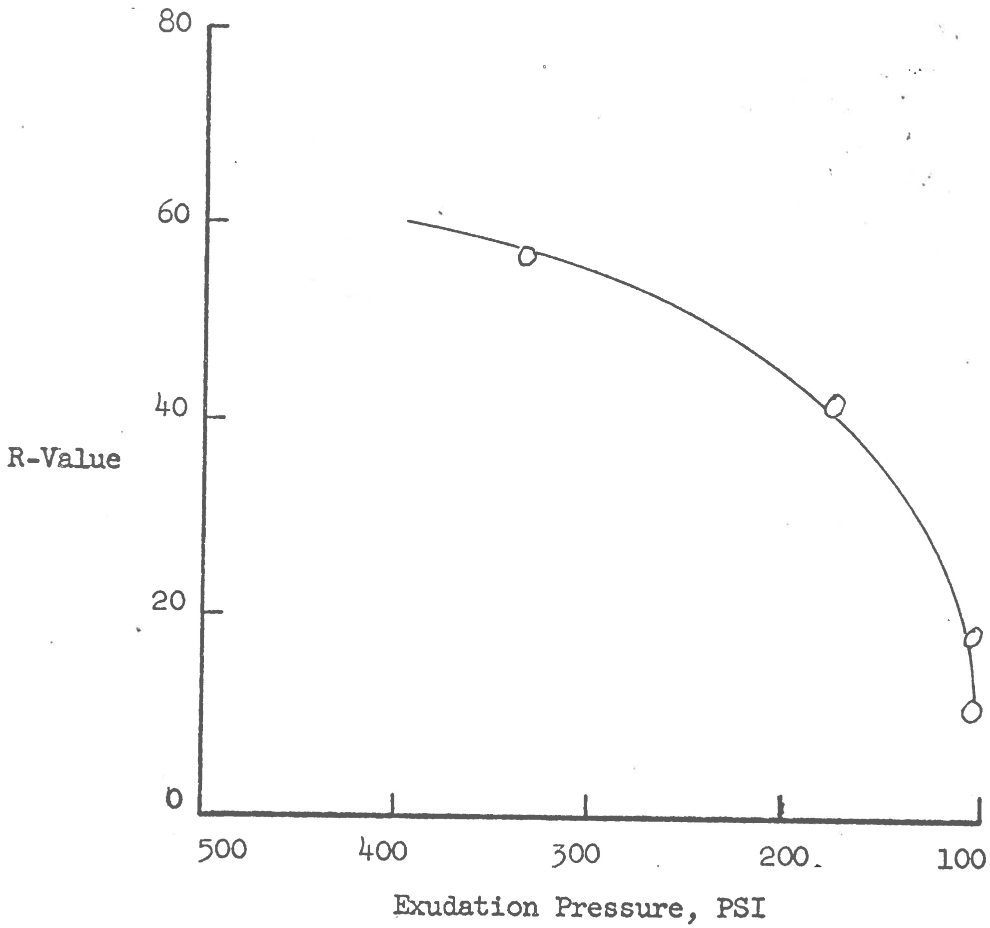
R-Value at 240 PSI: 34
R-Value at 300 PSI: 50



Summary of Data
California R-Value

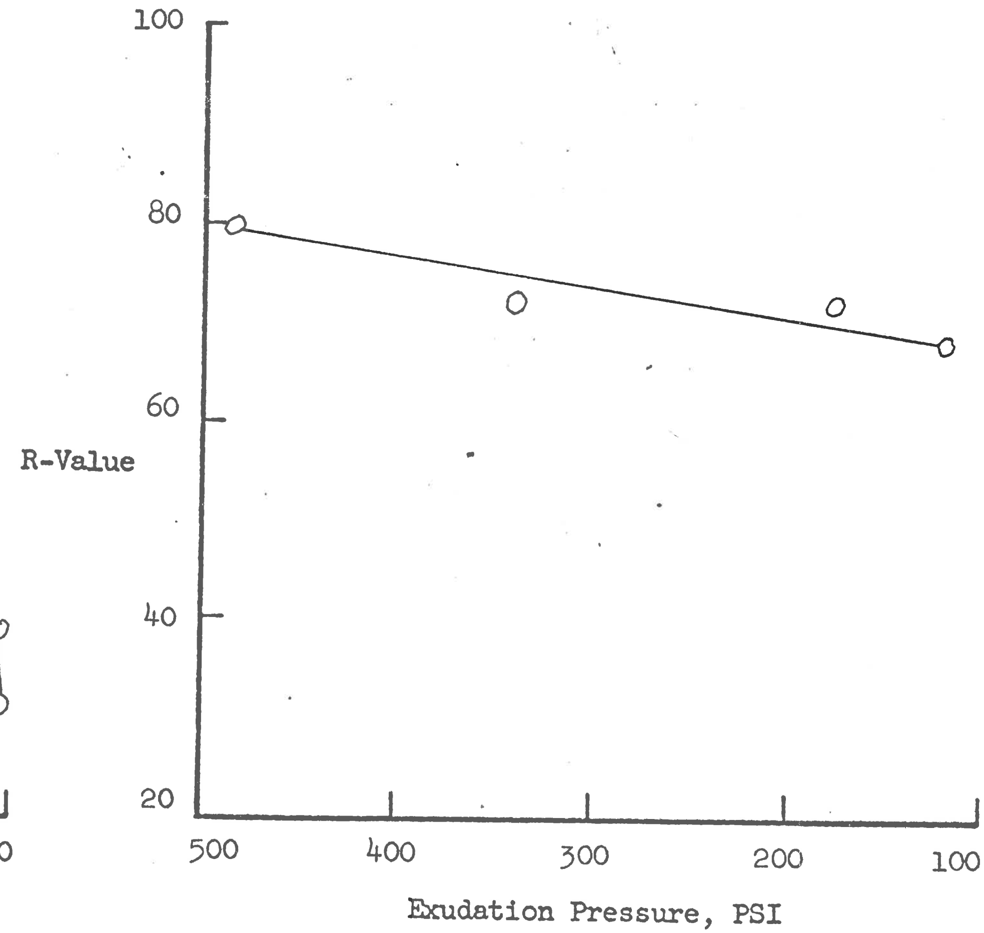
Sample No.: 85
Date Tested: 10-5-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 50
R-Value at 300 PSI: 55



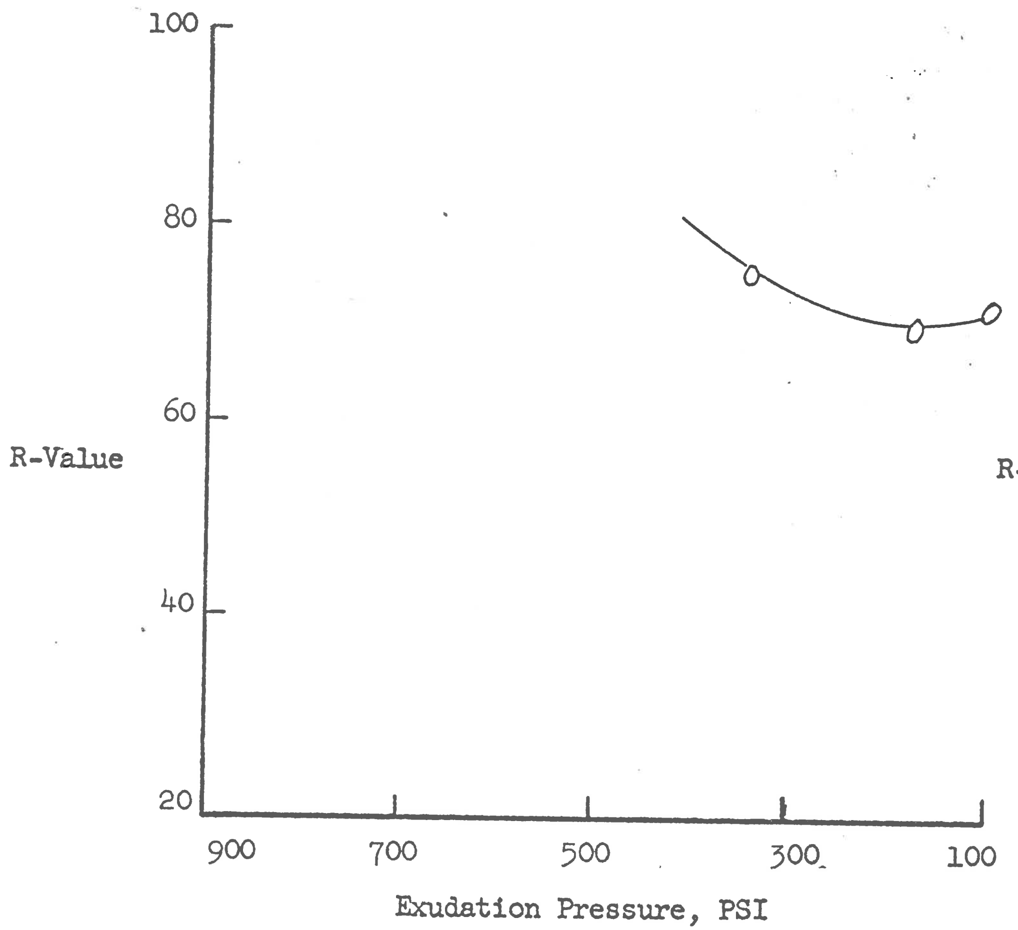
Sample No.: 86
Date Tested: 10-11-65
Visual Description: Tan Sand

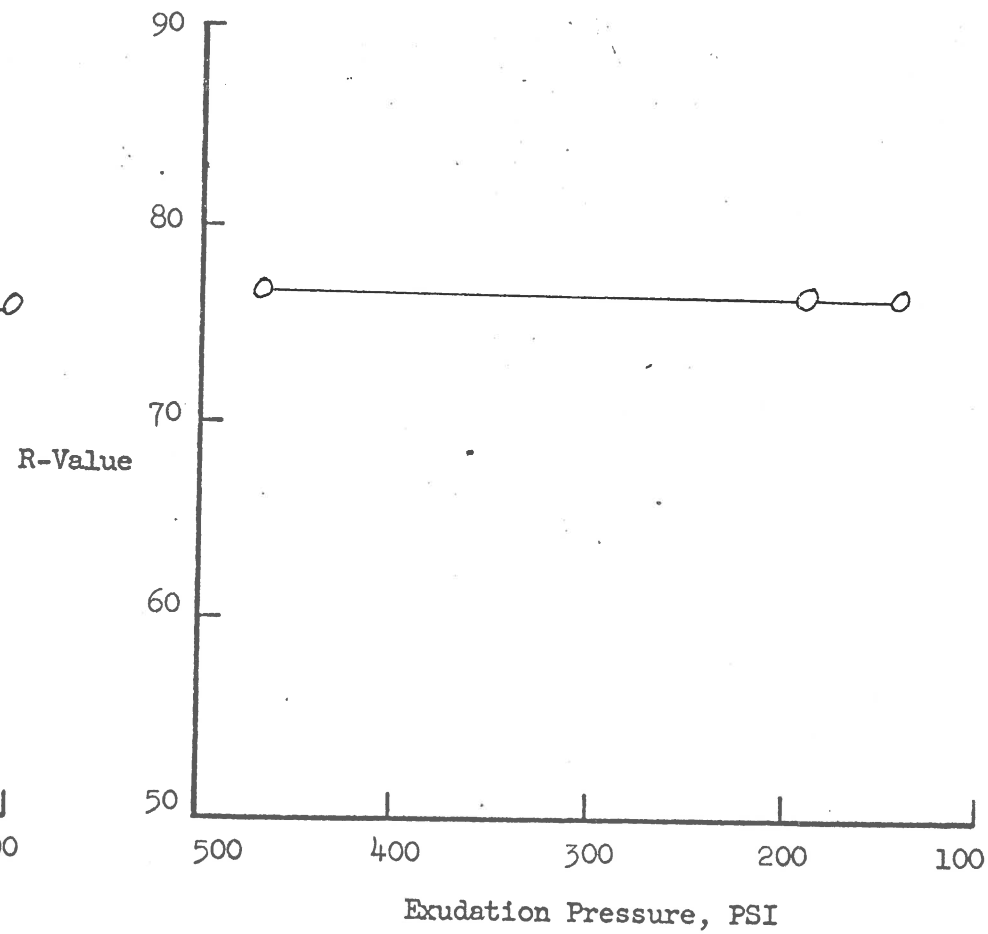
R-Value at 240 PSI: 73
R-Value at 300 PSI: 75



Summary of Data
California R-Value

Sample No.:	87	Sample No.:	88
Date Tested:	2-8-66	Date Tested:	10-11-65
Visual Description:	Tan Sand	Visual Description:	White Silt
R-Value at 240 PSI:	73	R-Value at 240 PSI:	77
R-Value at 300 PSI:	75	R-Value at 300 PSI:	77

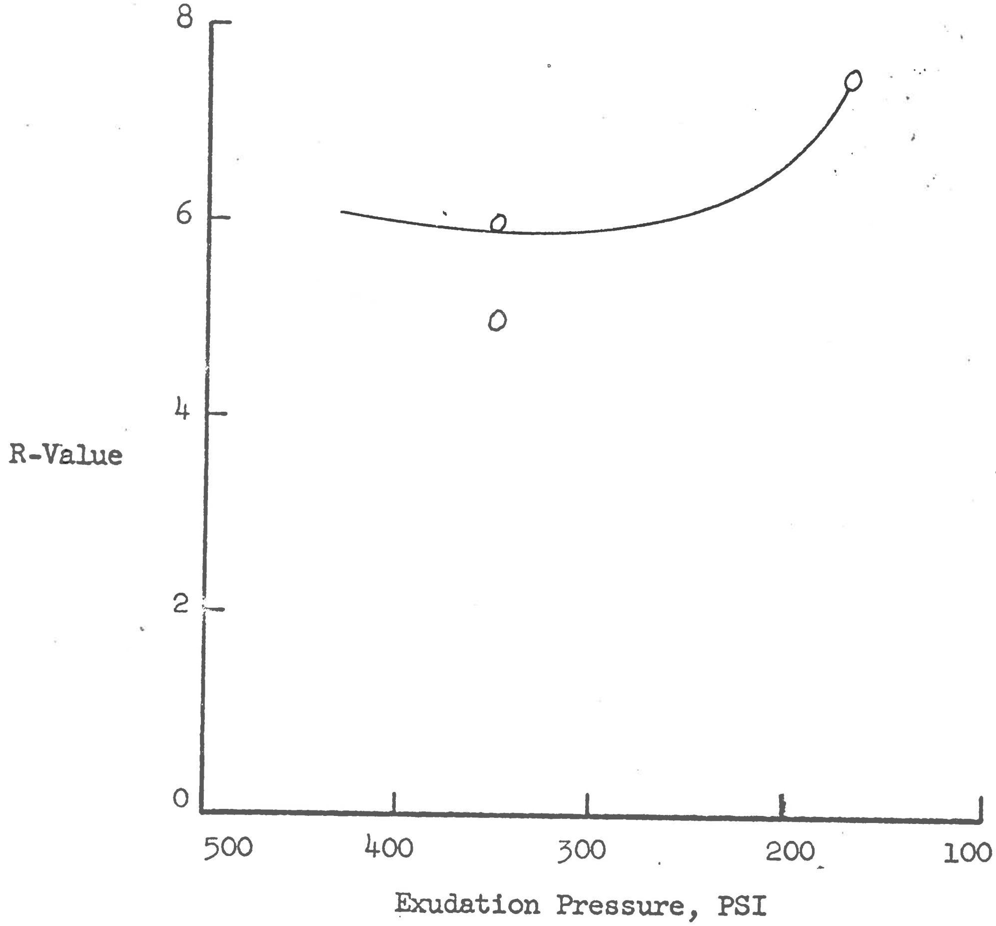




Summary of Data
California R-Value

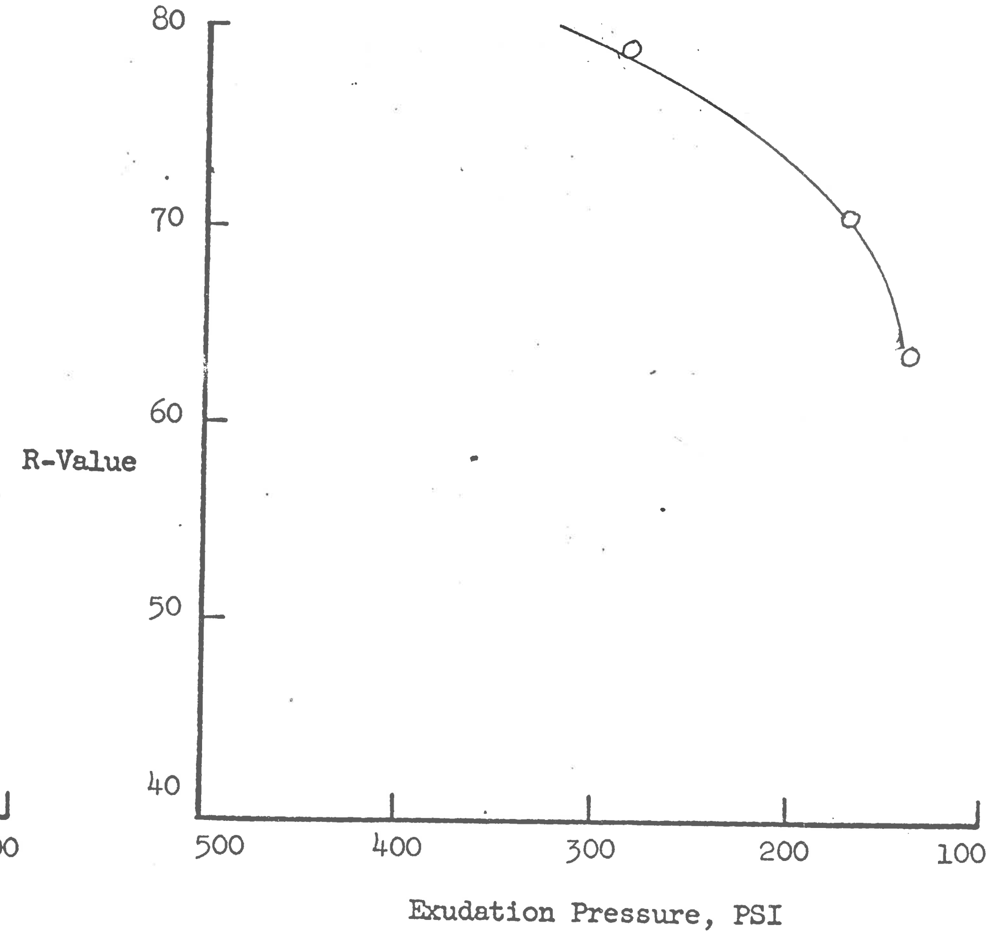
Sample No.: 89
Date Tested: 10-11-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 06
R-Value at 300 PSI: 06



Sample No.: 90
Date Tested: 10-11-65
Visual Description: Tan Sand

R-Value at 240 PSI: 76
R-Value at 300 PSI: 81



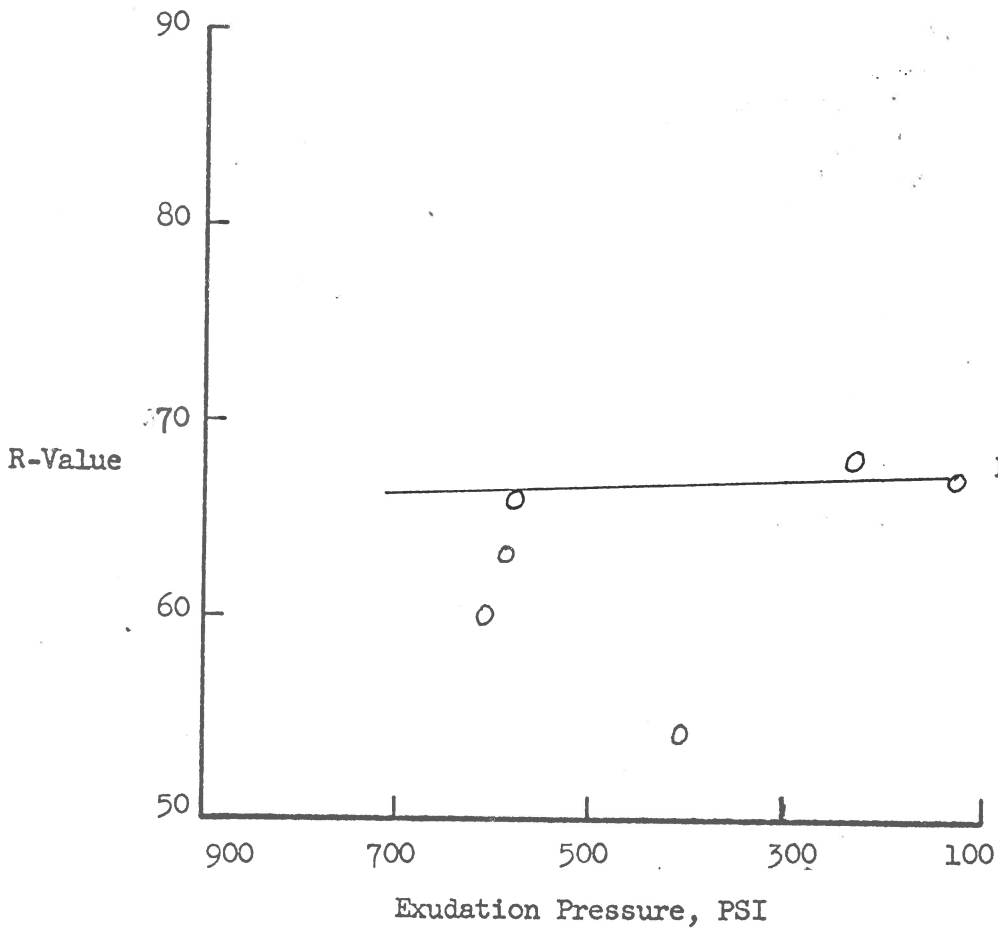
Summary of Data
California R-Value

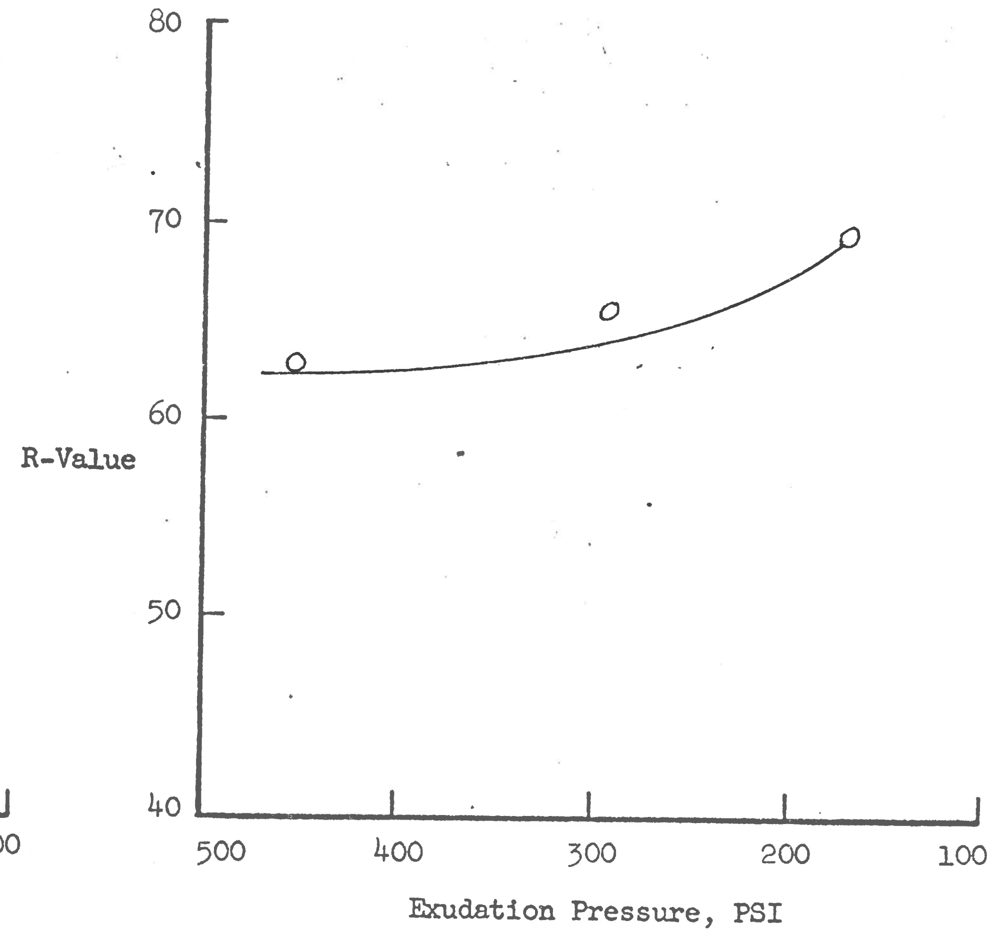
Sample No.: 91
Date Tested: 10-28-65
Visual Description: Brown Silty Sand

R-Value at 240 PSI: 67
R-Value at 300 PSI: 67

Sample No.: 92
Date Tested: 10-28-65
Visual Description: Tan Sand

R-Value at 240 PSI: 64
R-Value at 300 PSI: 64

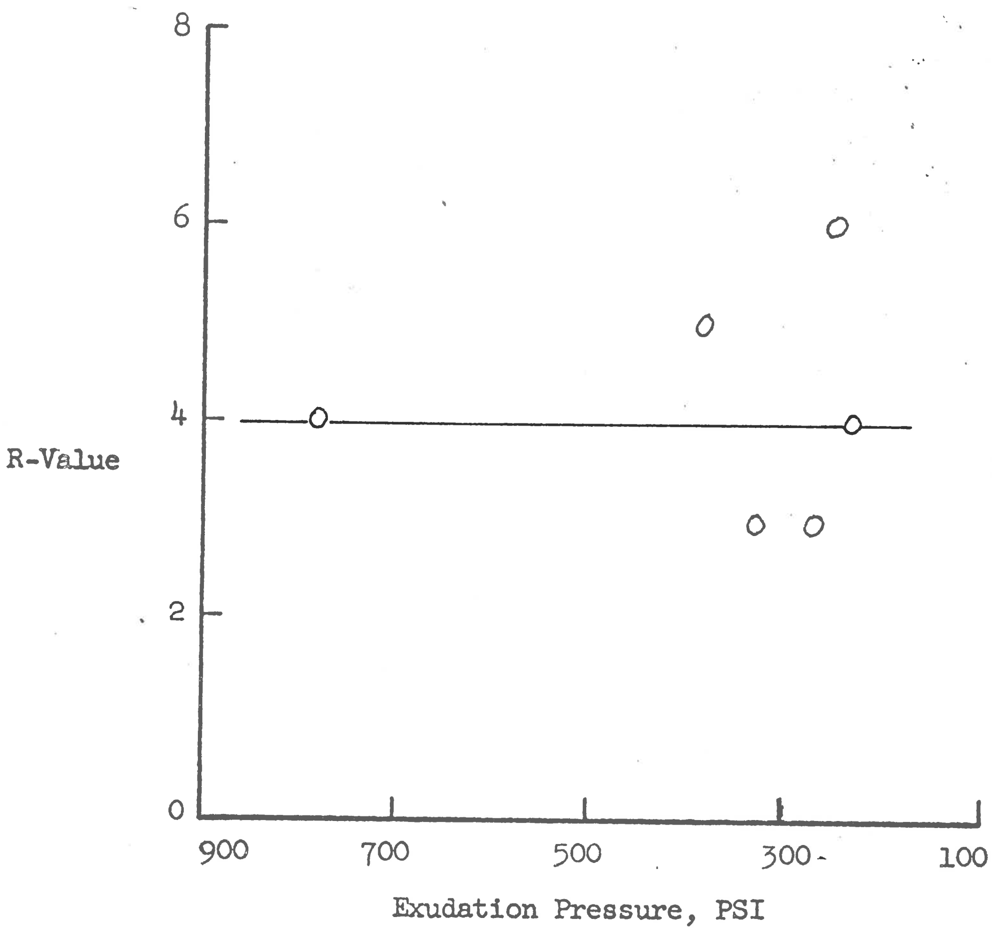




Summary of Data
California R-Value

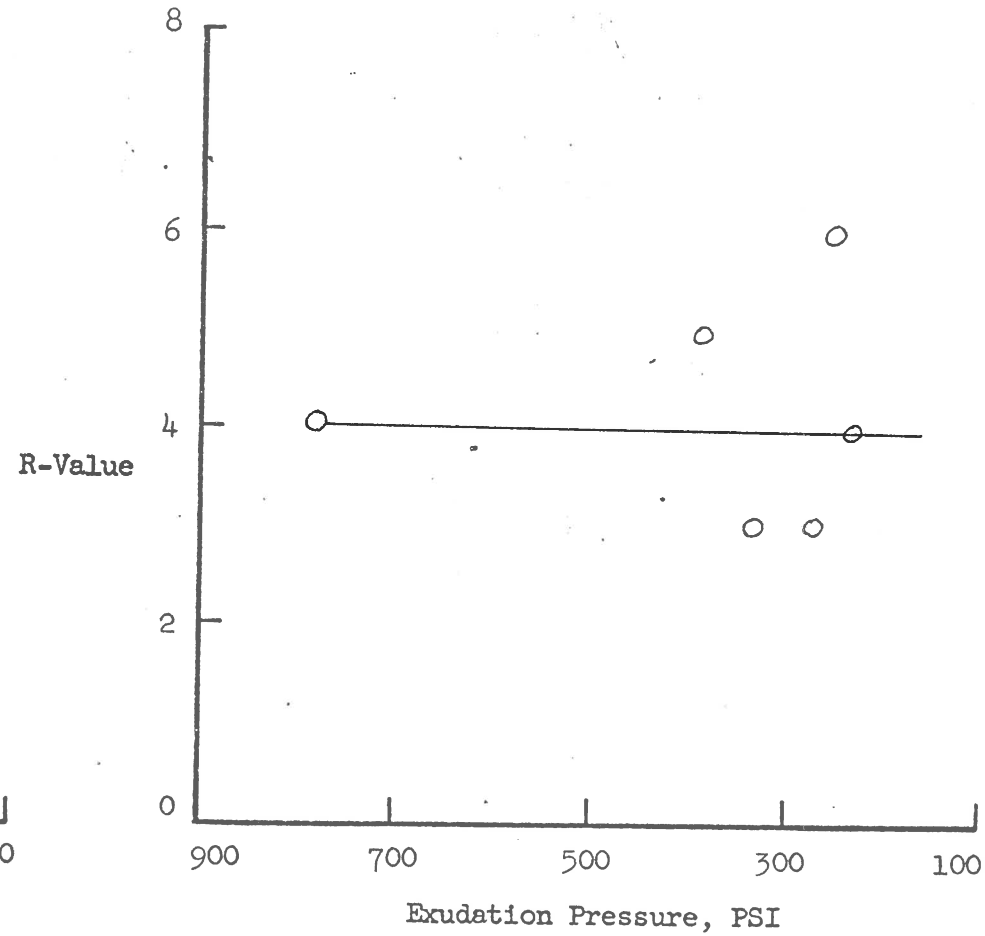
Sample No.: 93
Date Tested: 10-28-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 04
R-Value at 300 PSI: 04



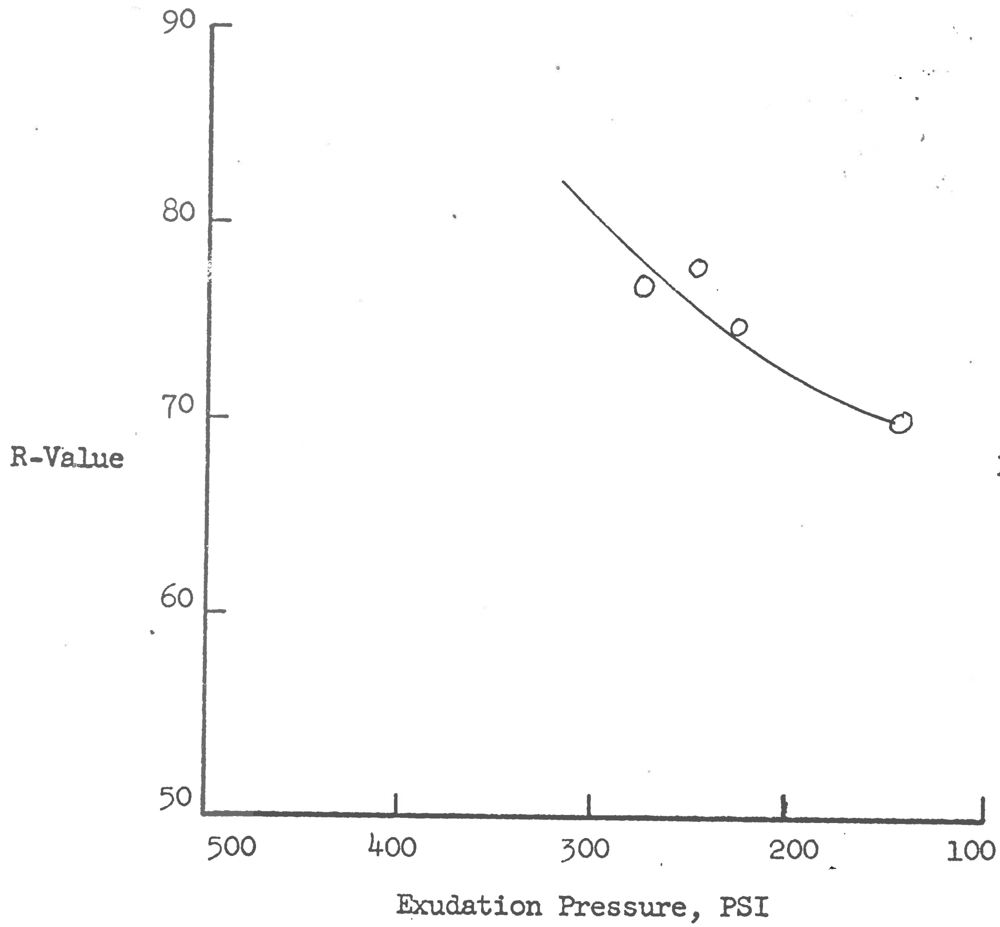
Sample No.: 94
Date Tested: 10-28-65
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 04
R-Value at 300 PSI: 04

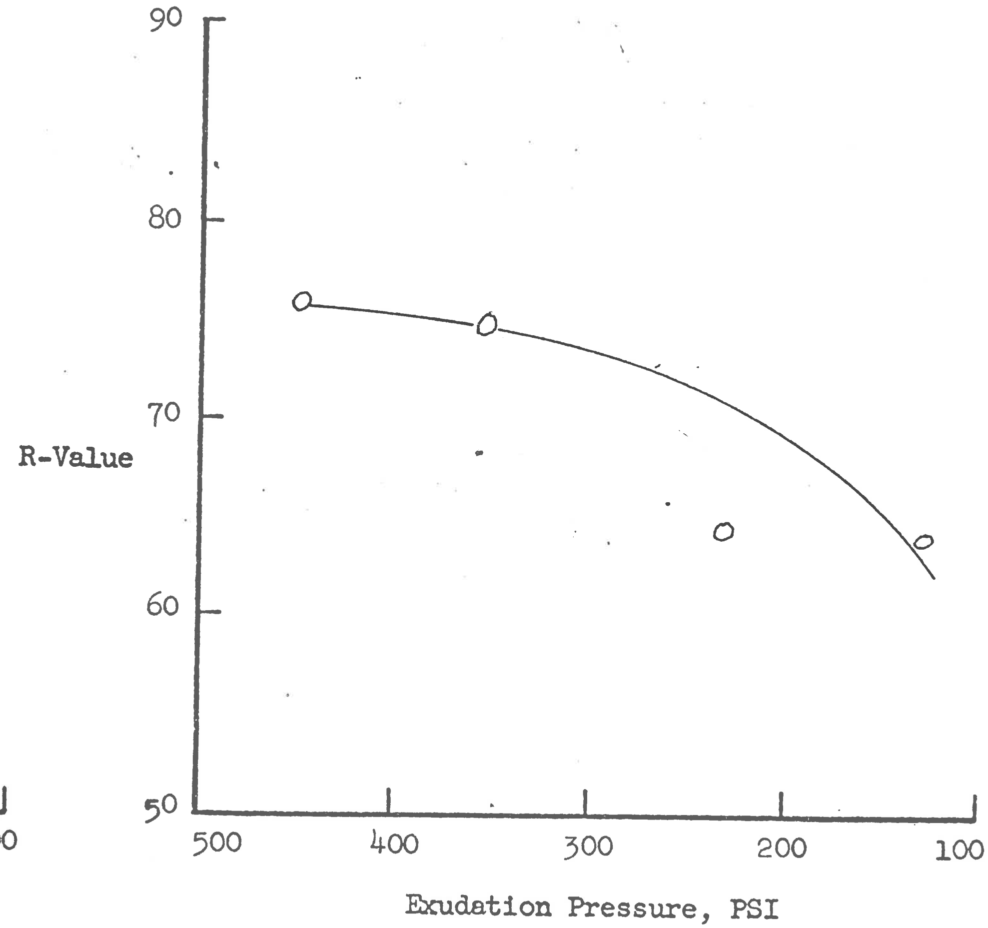


Summary of Data
California R-Value

Sample No.:	96
Date Tested:	11-22-65
Visual Description:	Tan Sand
R-Value at 240 PSI:	77
R-Value at 300 PSI:	80



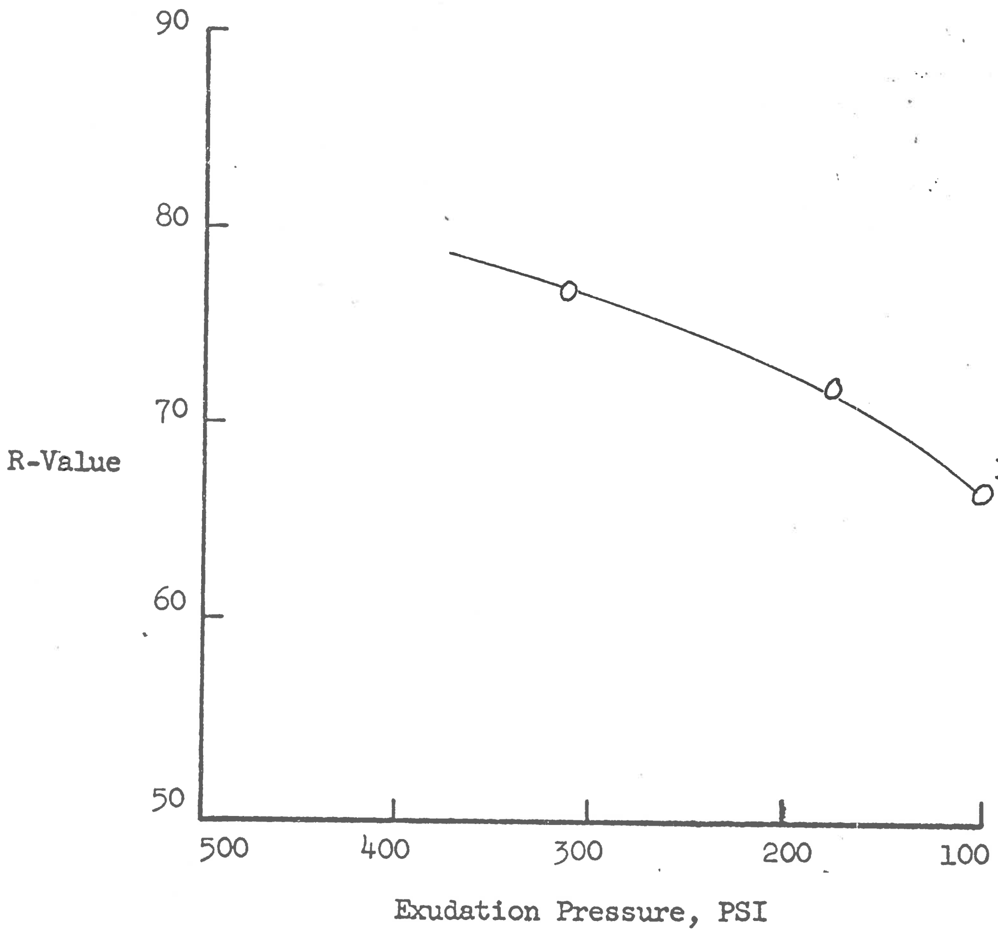
Sample No.:	97
Date Tested:	10-28-65
Visual Description:	Brown Silty Sand
R-Value at 240 PSI:	71
R-Value at 300 PSI:	74



Summary of Data
California R-Value

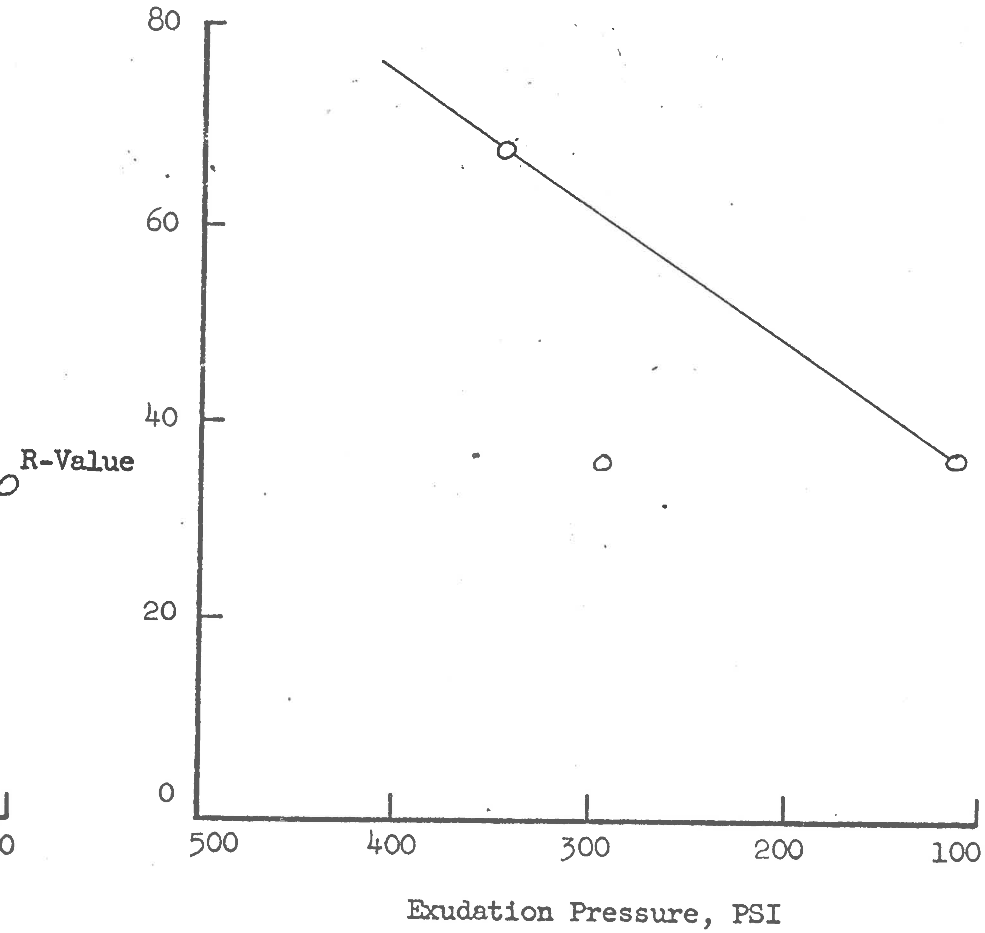
Sample No.: 98
Date Tested: 10-28-65
Visual Description: Tan Sand

R-Value at 240 PSI: 74
R-Value at 300 PSI: 76



Sample No.: 99
Date Tested: 10-27-65
Visual Description: Red Sandy Clay

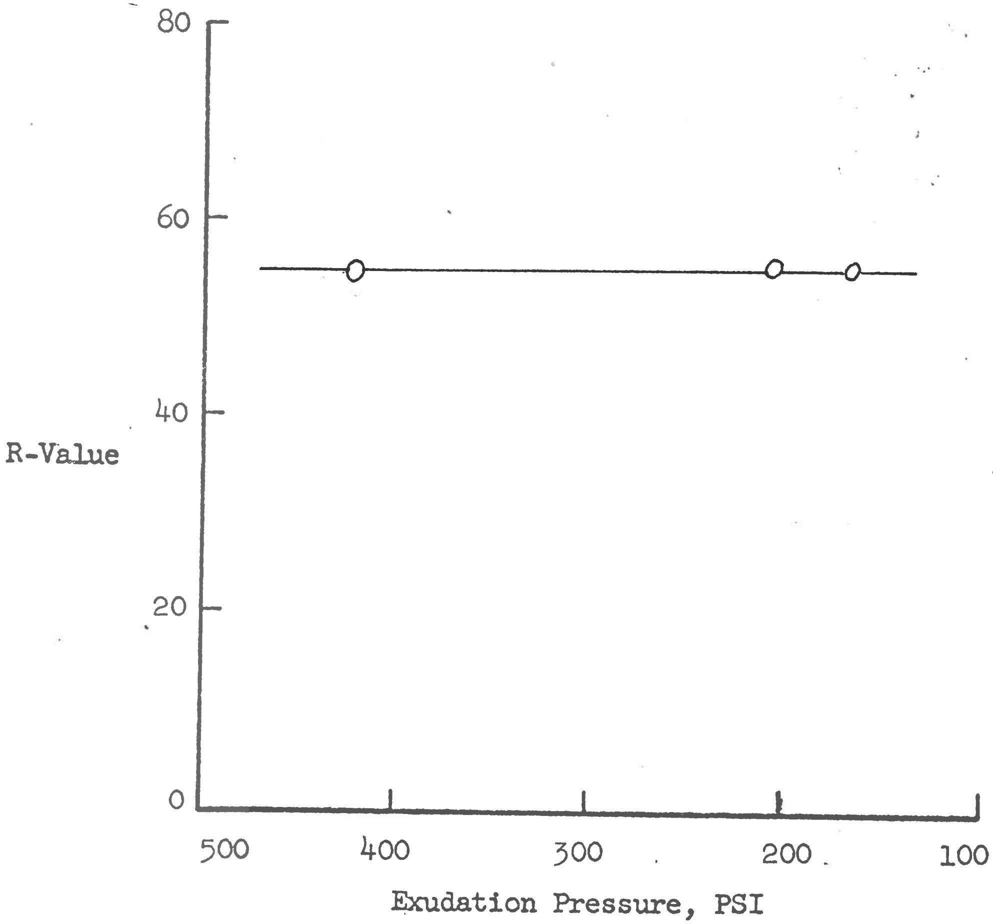
R-Value at 240 PSI: 54
R-Value at 300 PSI: 61



Summary of Data
California R-Value

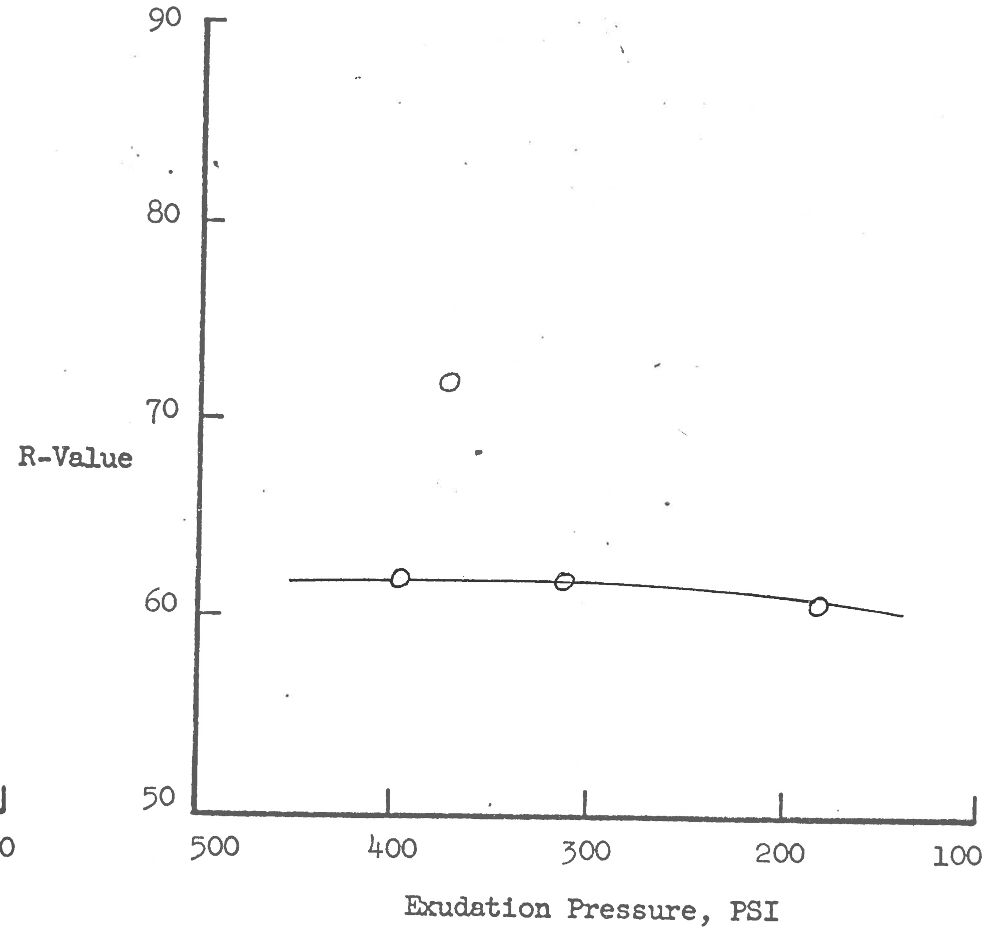
Sample No.: 100
Date Tested: 11-9-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 56
R-Value at 300 PSI: 56



Sample No.: 101
Date Tested: 11-4-65
Visual Description: Brown Sand

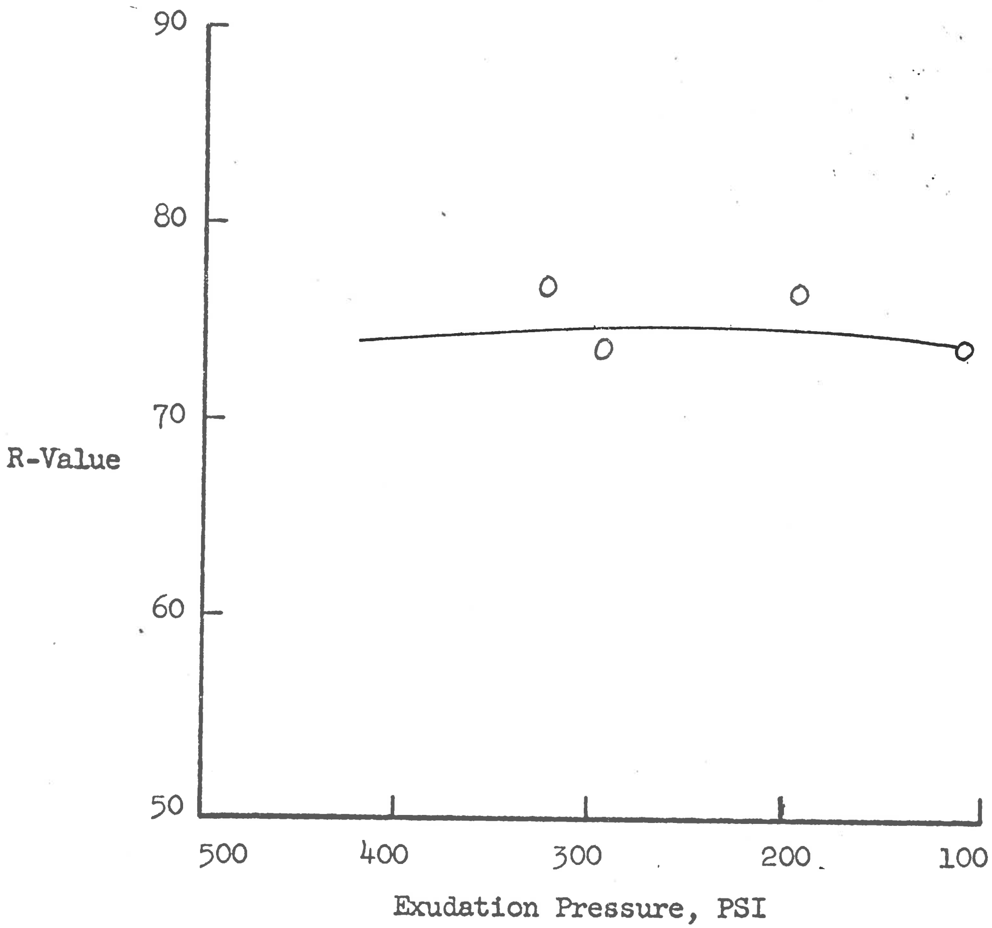
R-Value at 240 PSI: 62
R-Value at 300 PSI: 62



Summary of Data
California R-Value

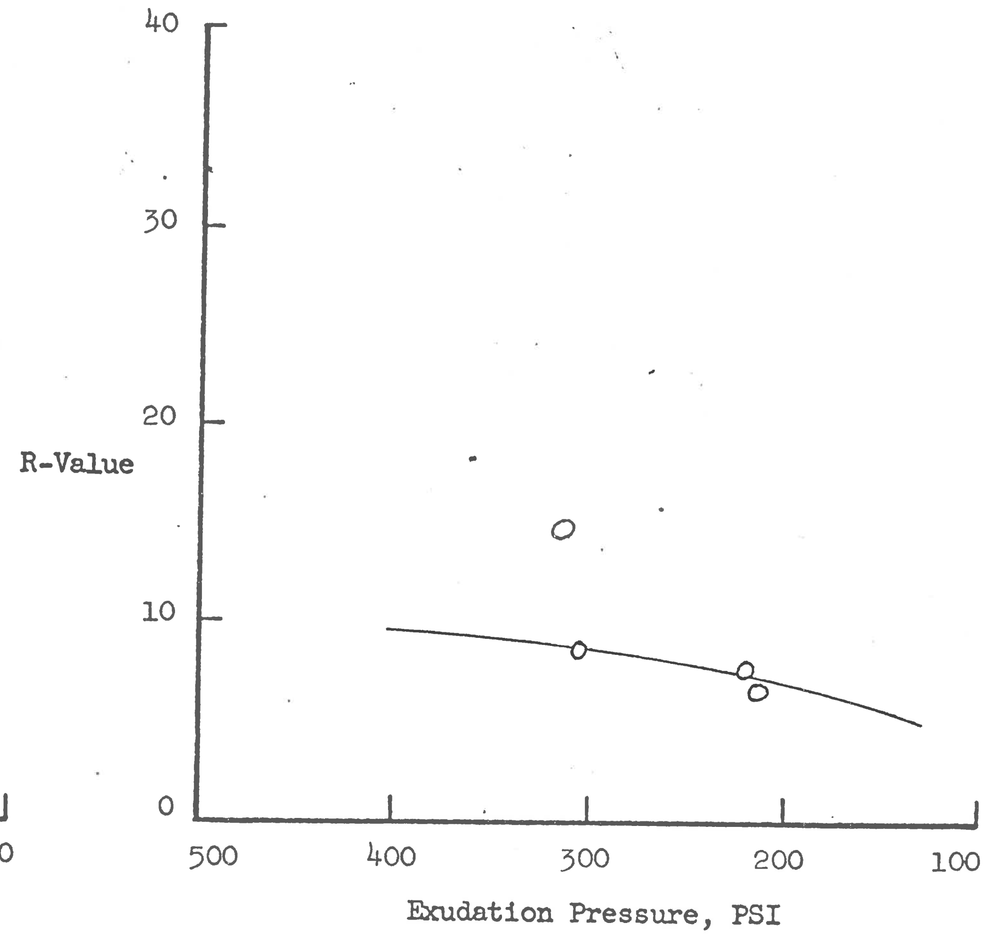
Sample No.: 102
Date Tested: 11-4-65
Visual Description: Brown Silty Sand

R-Value at 240 PSI: 75
R-Value at 300 PSI: 75



Sample No.: 103
Date Tested: 11-8-65
Visual Description: Tan Clay

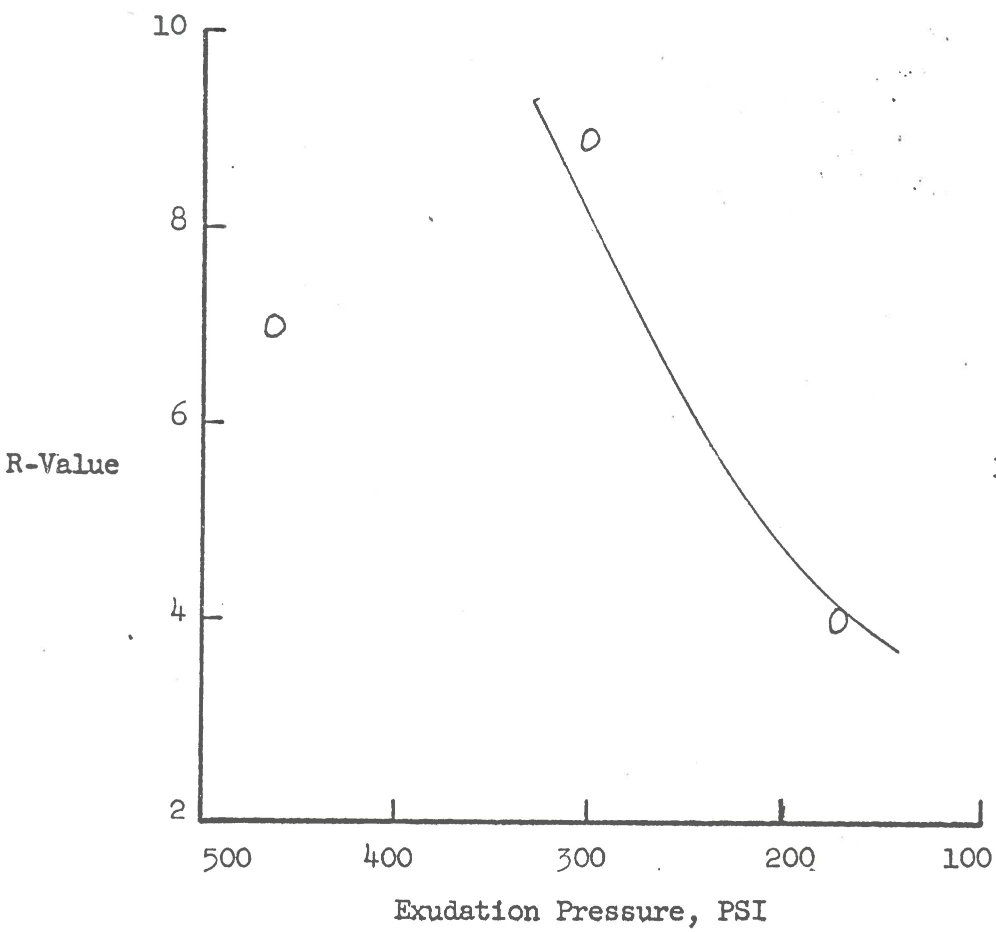
R-Value at 240 PSI: 08
R-Value at 300 PSI: 09



Summary of Data
California R-Value

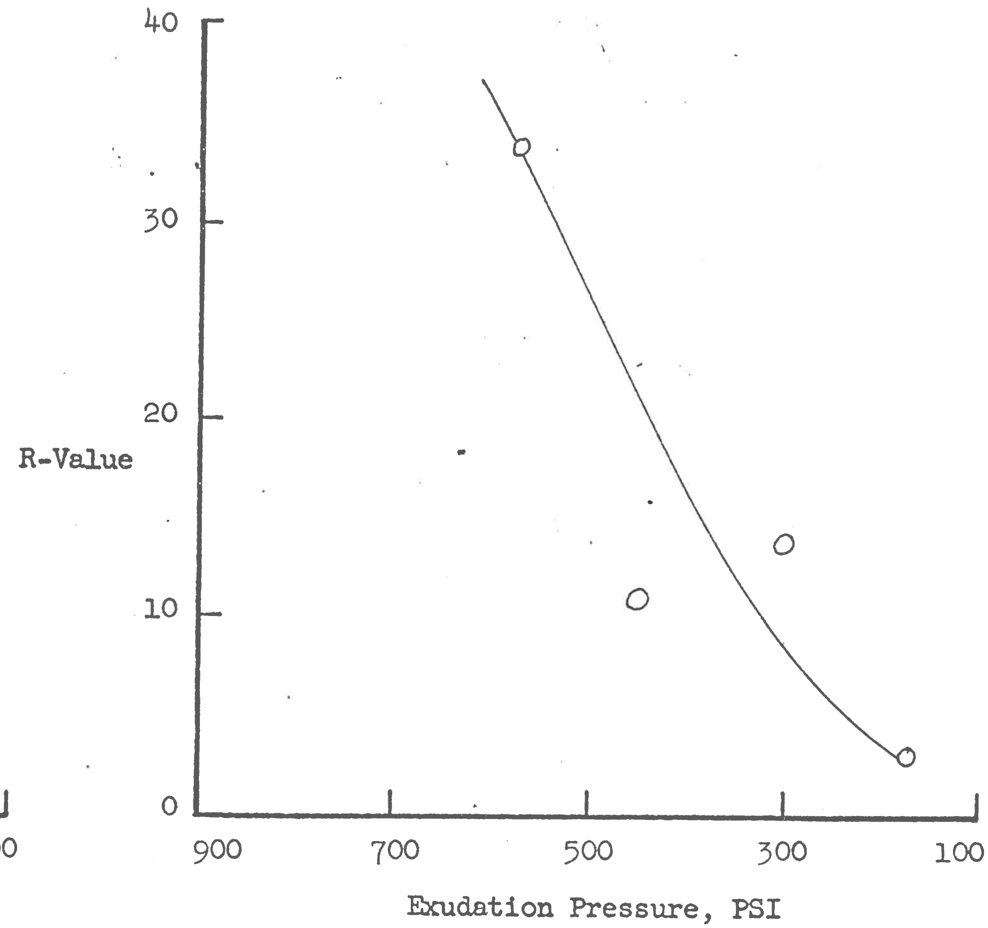
Sample No.: 104
Date Tested: 11-4-65
Visual Description: Tan Clay

R-Value at 240 PSI: 06
R-Value at 300 PSI: 08



Sample No.: 105
Date Tested: 11-8-65
Visual Description: Red Silty Clay

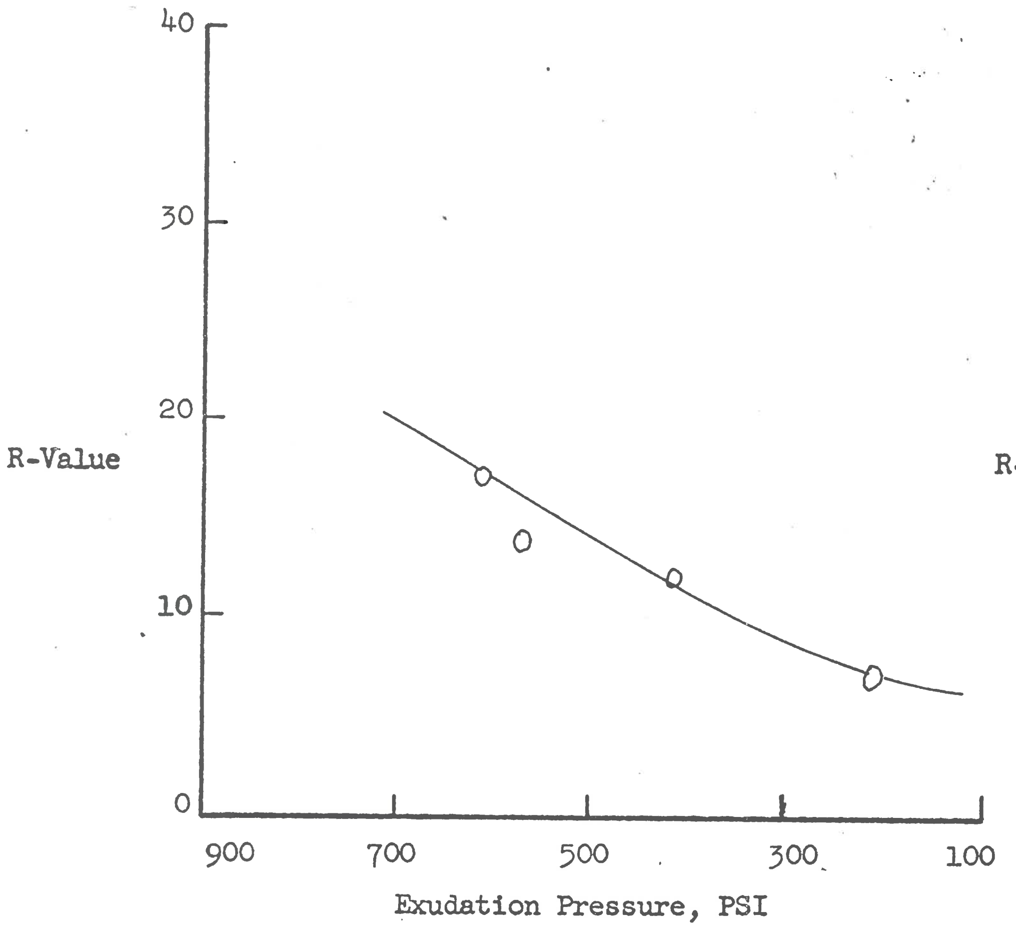
R-Value at 240 PSI: 06
R-Value at 300 PSI: 09



Summary of Data
California R-Value

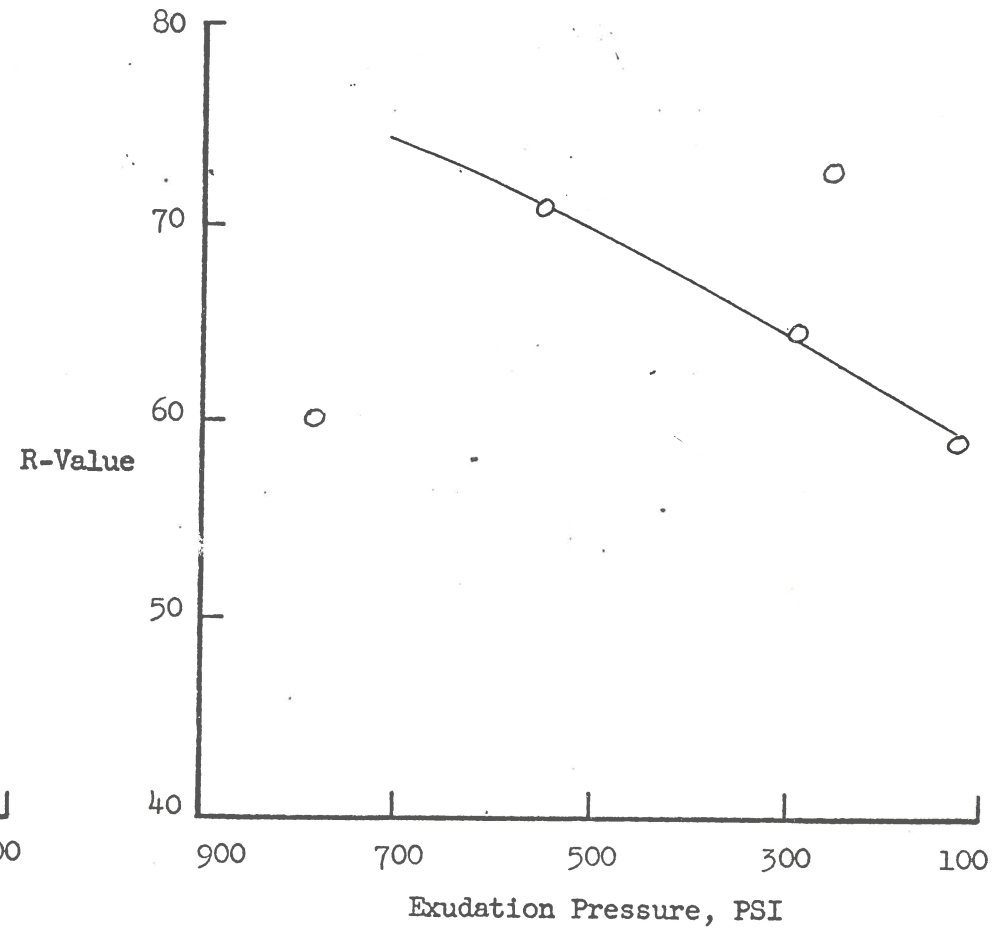
Sample No.: 106
Date Tested: 11-9-65
Visual Description: Brown Clay

R-Value at 240 PSI: 08
R-Value at 300 PSI: 10



Sample No.: 107
Date Tested: 11-9-65
Visual Description: Tan Sand

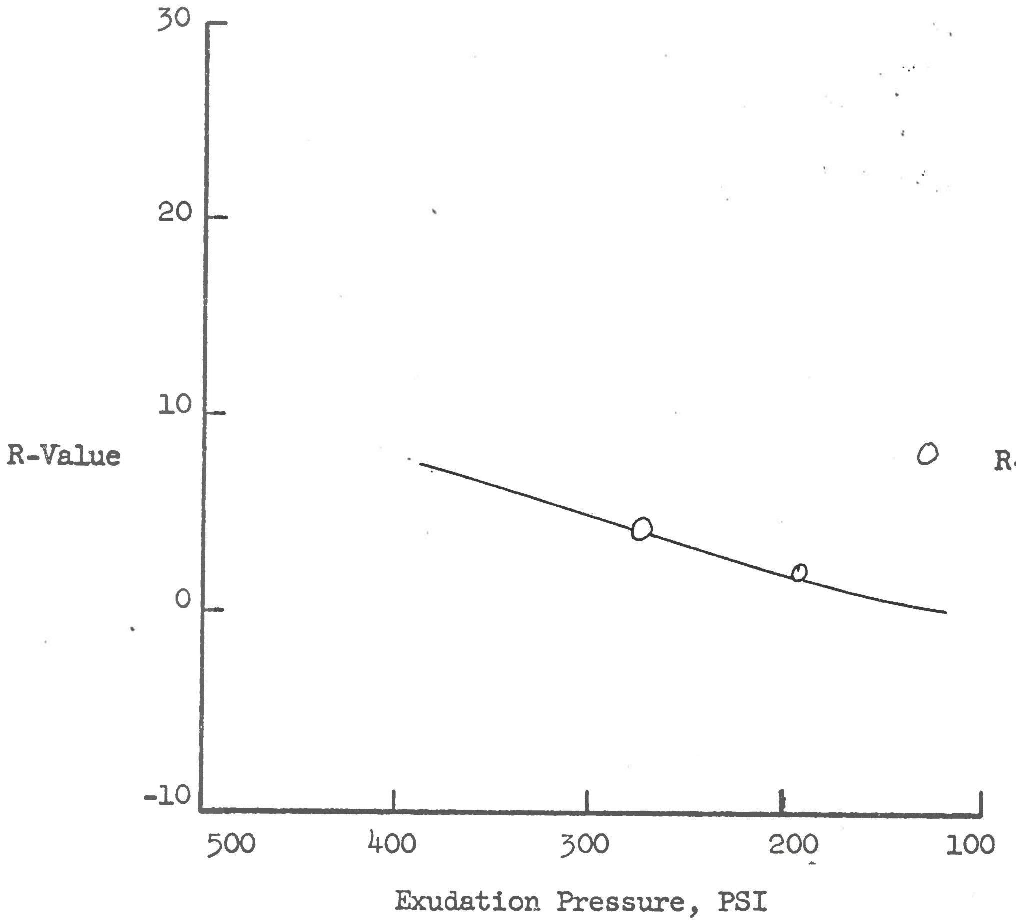
R-Value at 240 PSI: 63
R-Value at 300 PSI: 65



Summary of Data
California R-Value

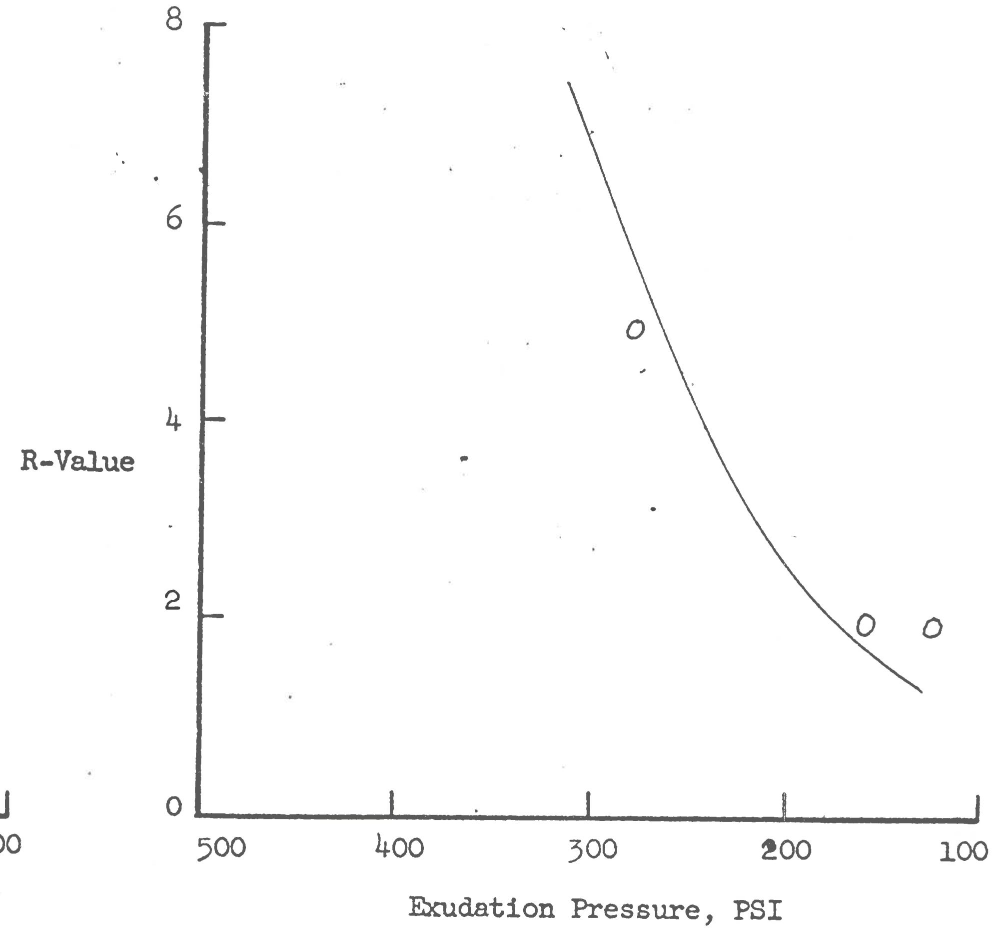
Sample No.: 108
Date Tested: 11-9-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 03
R-Value at 300 PSI: 05



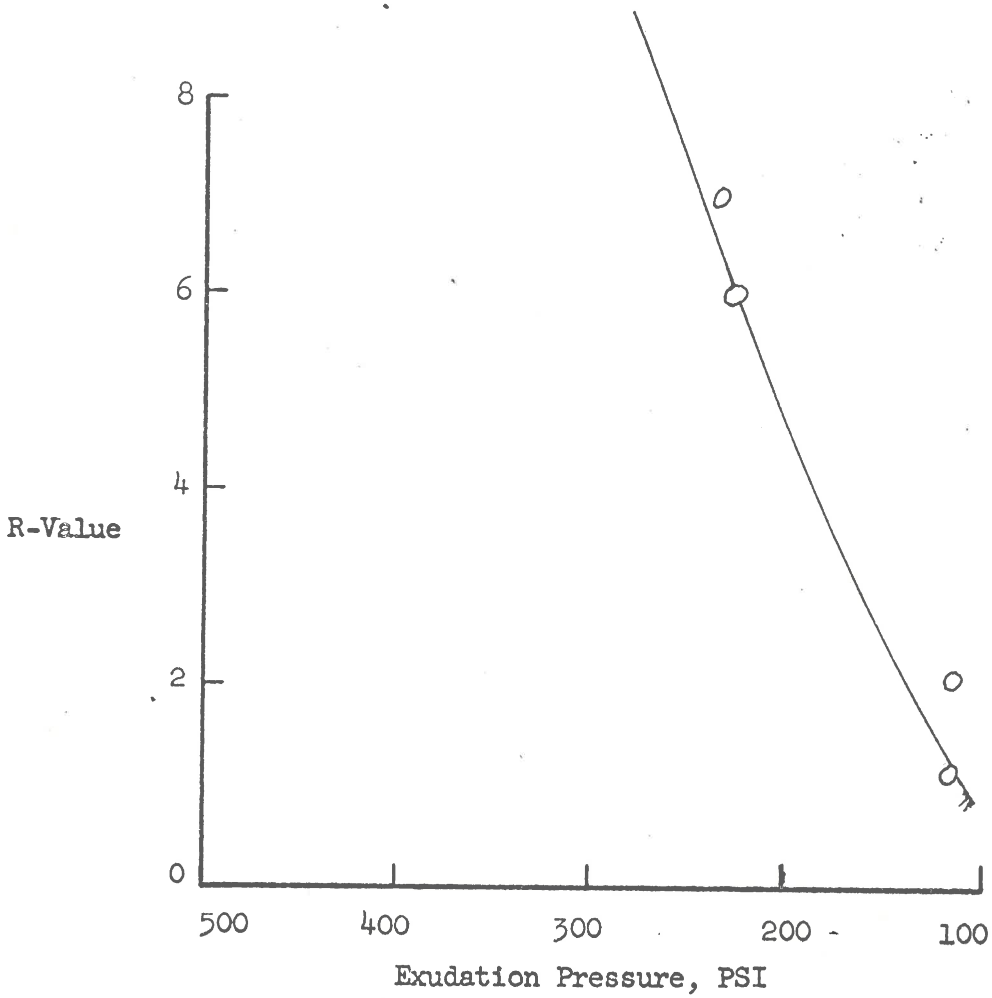
Sample No.: 109
Date Tested: 11-9-65
Visual Description: Red Clayey Silt

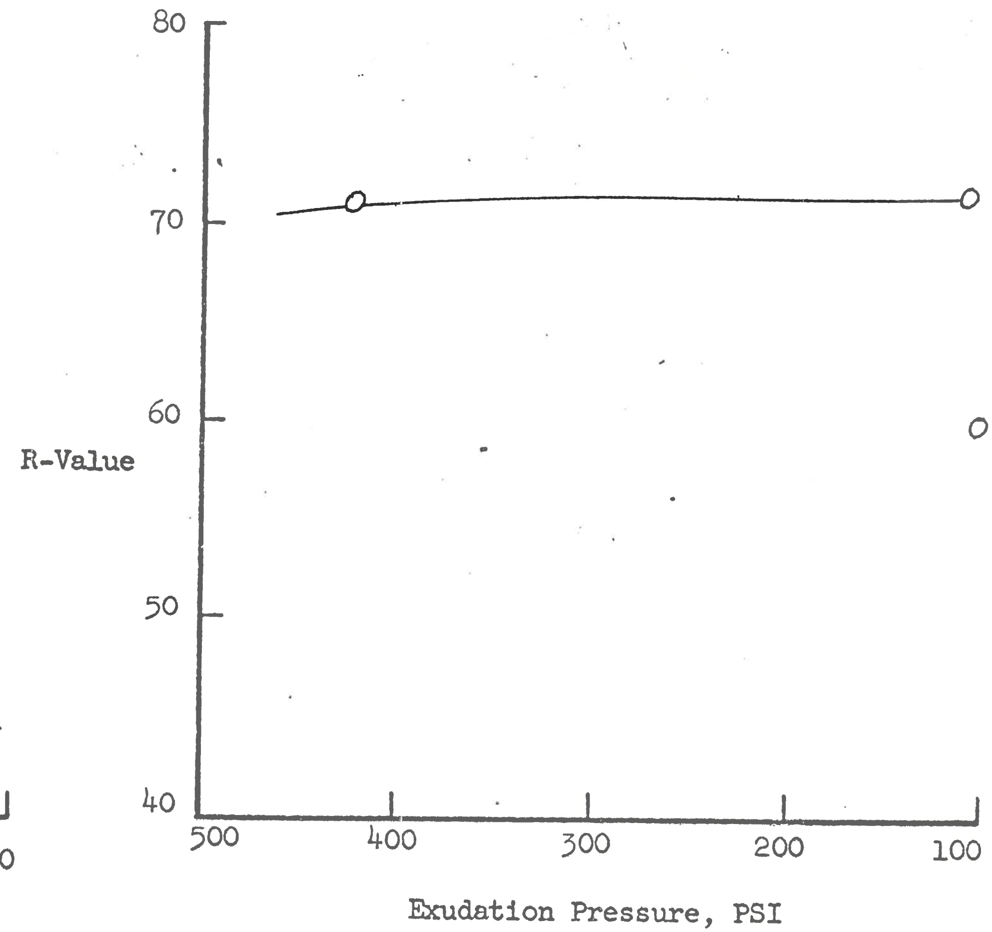
R-Value at 240 PSI: 04
R-Value at 300 PSI: 07



Summary of Data
California R-Value

Sample No.:	110	Sample No.:	111
Date Tested:	11-9-65	Date Tested:	11-11-65
Visual Description:	Red Sandy Clay	Visual Description:	Tan Sand
R-Value at 240 PSI:	07	R-Value at 240 PSI:	71
R-Value at 300 PSI:	10	R-Value at 300 PSI:	71

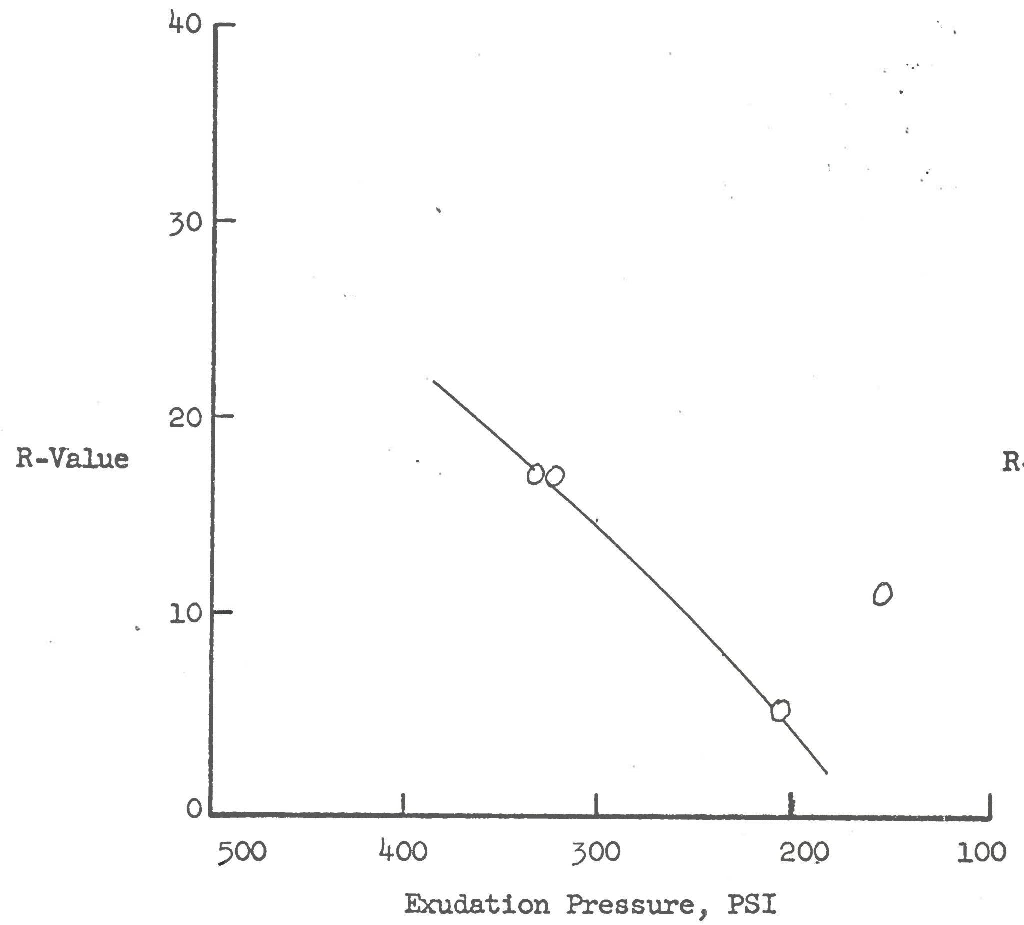




Summary of Data
California R-Value

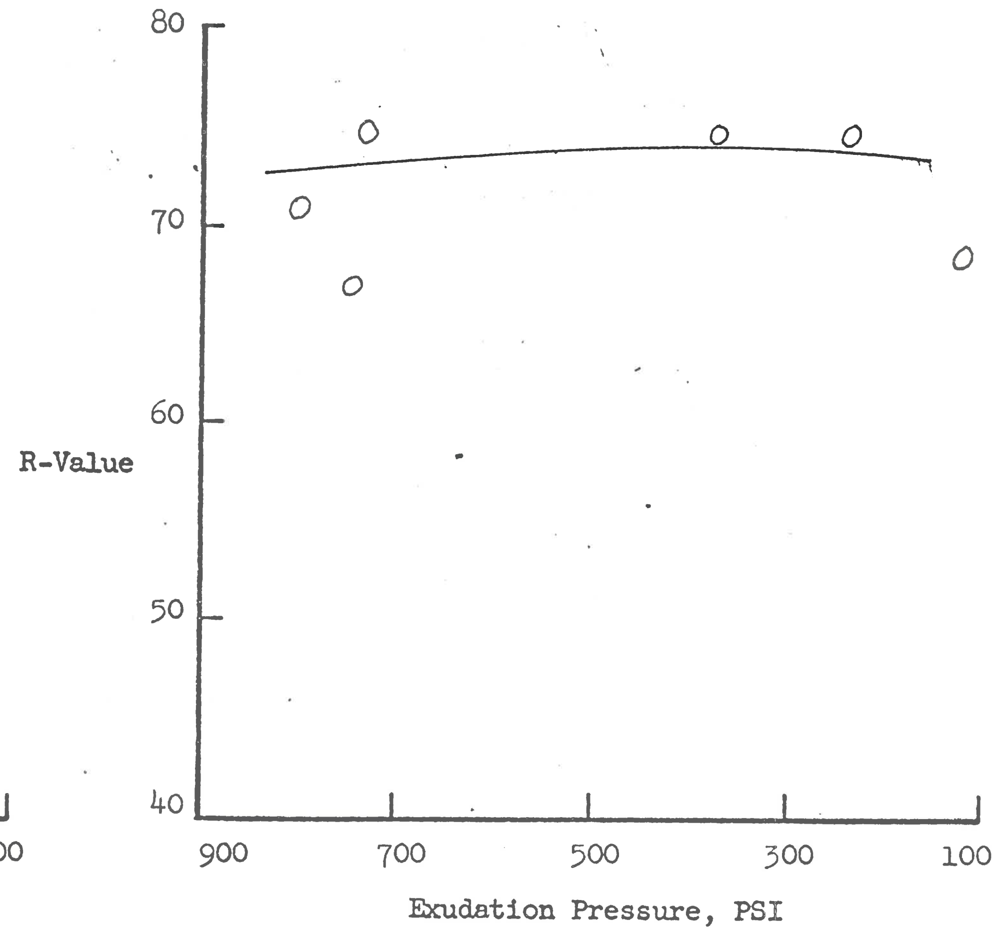
Sample No.: 112
Date Tested: 11-11-65
Visual Description: Red Clay

R-Value at 240 PSI: 08
R-Value at 300 PSI: 15



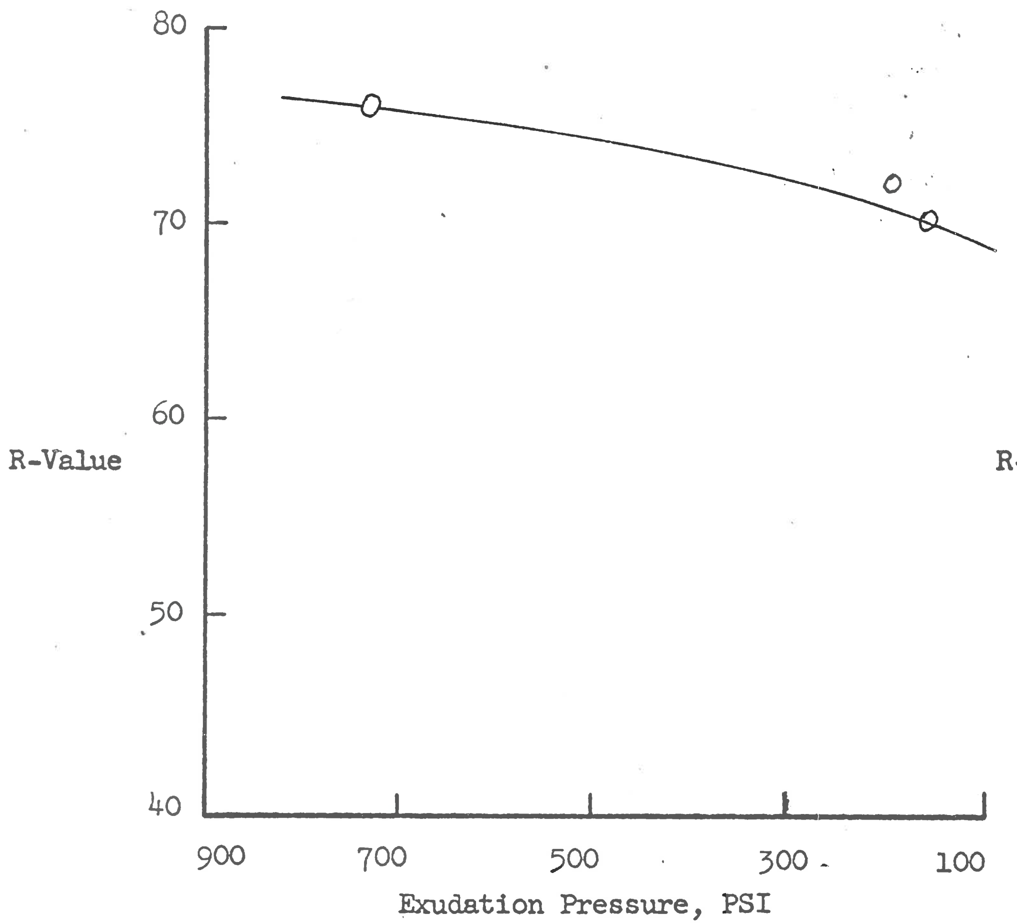
Sample No.: 113
Date Tested: 11-22-65
Visual Description: Tan Sand

R-Value at 240 PSI: 73
R-Value at 300 PSI: 75

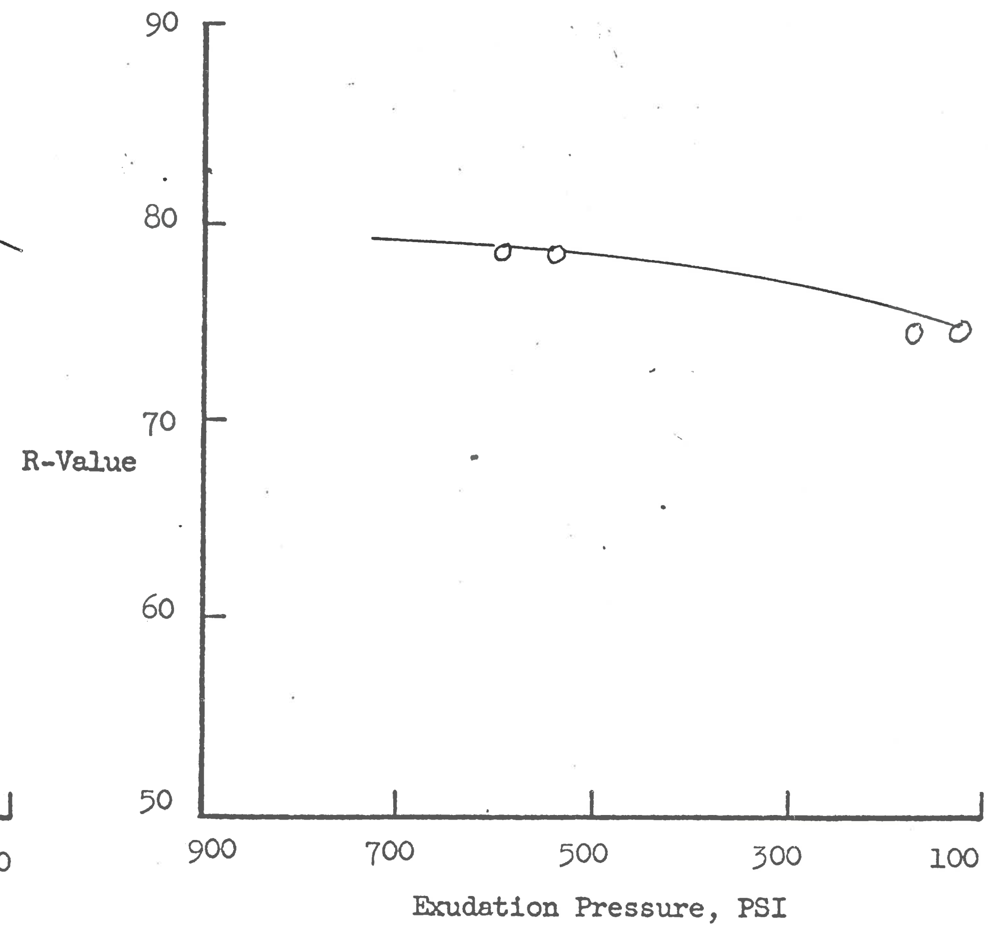


Summary of Data
California R-Value

Sample No.:	114
Date Tested:	11-22-65
Visual Description:	Red Sand
R-Value at 240 PSI:	71
R-Value at 300 PSI:	72



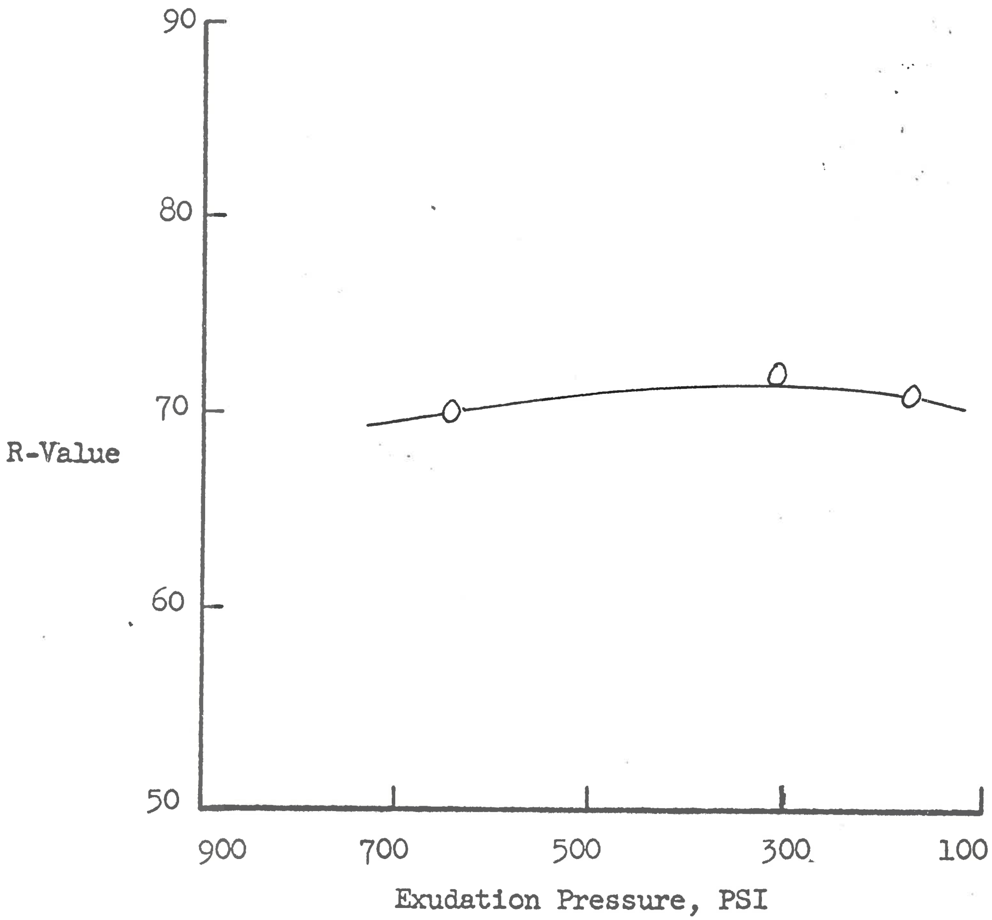
Sample No.:	115
Date Tested:	11-22-65
Visual Description:	Red Sand
R-Value at 240 PSI:	77
R-Value at 300 PSI:	78



Summary of Data
California R-Value

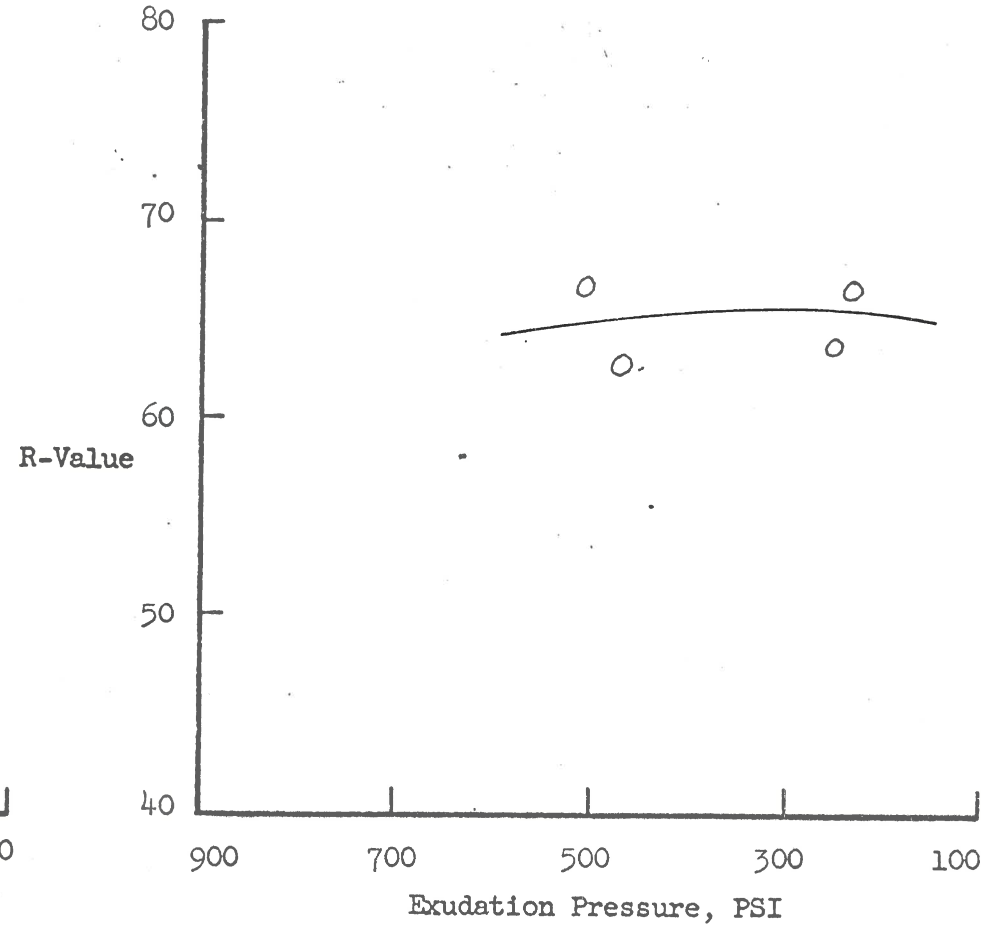
Sample No.: 116
Date Tested: 11-22-65
Visual Description: Tan Sand

R-Value at 240 PSI: 71
R-Value at 300 PSI: 71



Sample No.: 117
Date Tested: 11-22-65
Visual Description: White Sand

R-Value at 240 PSI: 66
R-Value at 300 PSI: 66



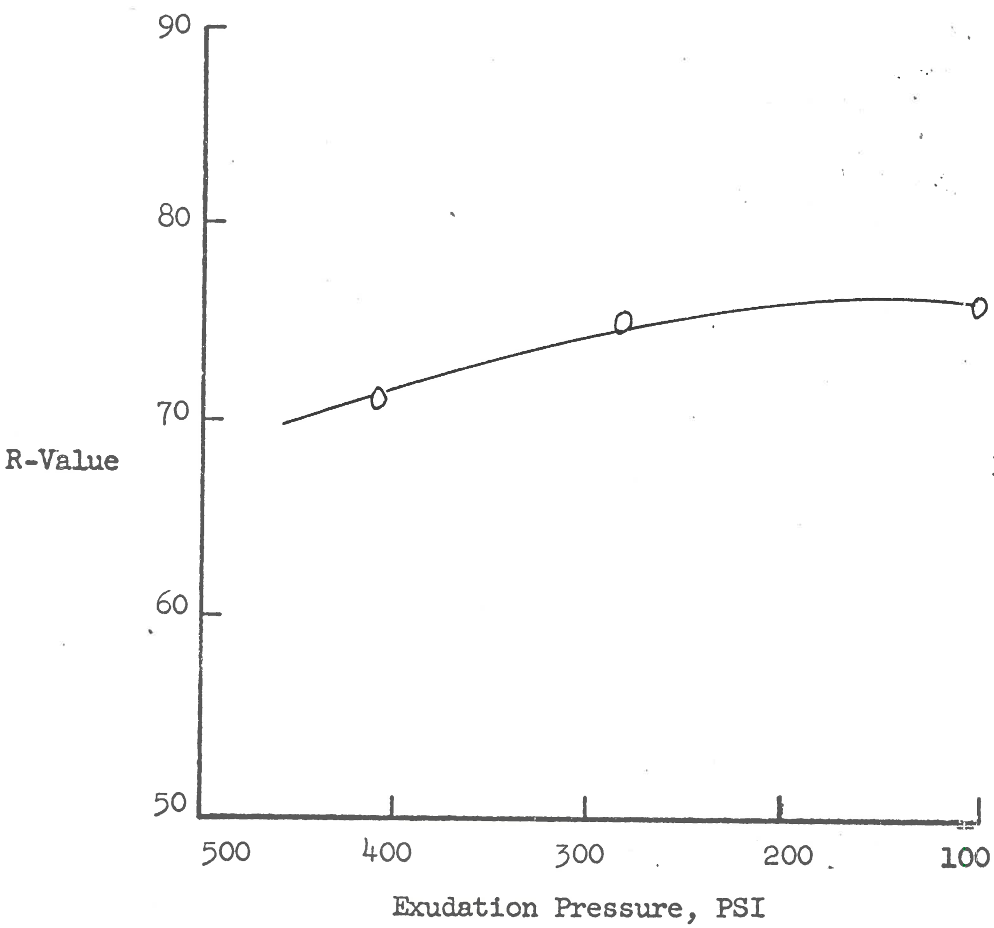
Summary of Data
California R-Value

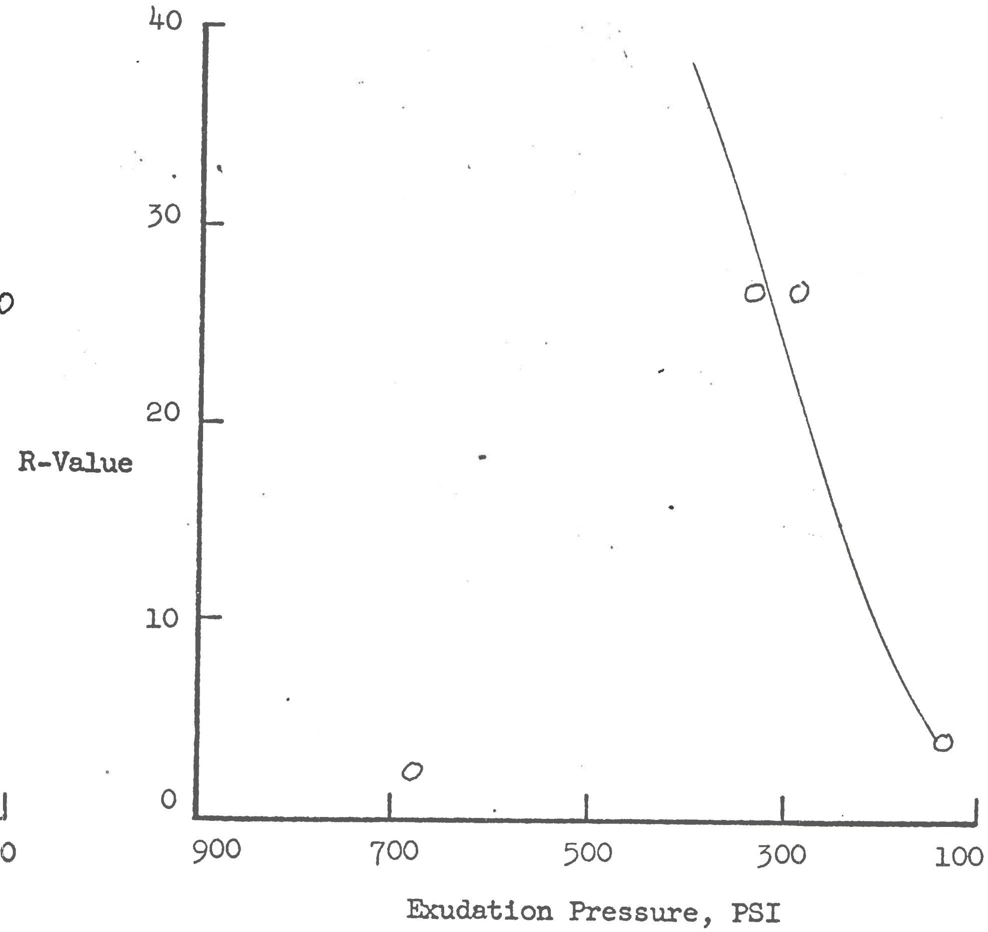
Sample No.: 118
Date Tested: 11-12-65
Visual Description: Red Sand

R-Value at 240 PSI: 75
R-Value at 300 PSI: 75

Sample No.: 119
Date Tested: 11-22-65
Visual Description: Red Silty Clay

R-Value at 240 PSI: 15
R-Value at 300 PSI: 27

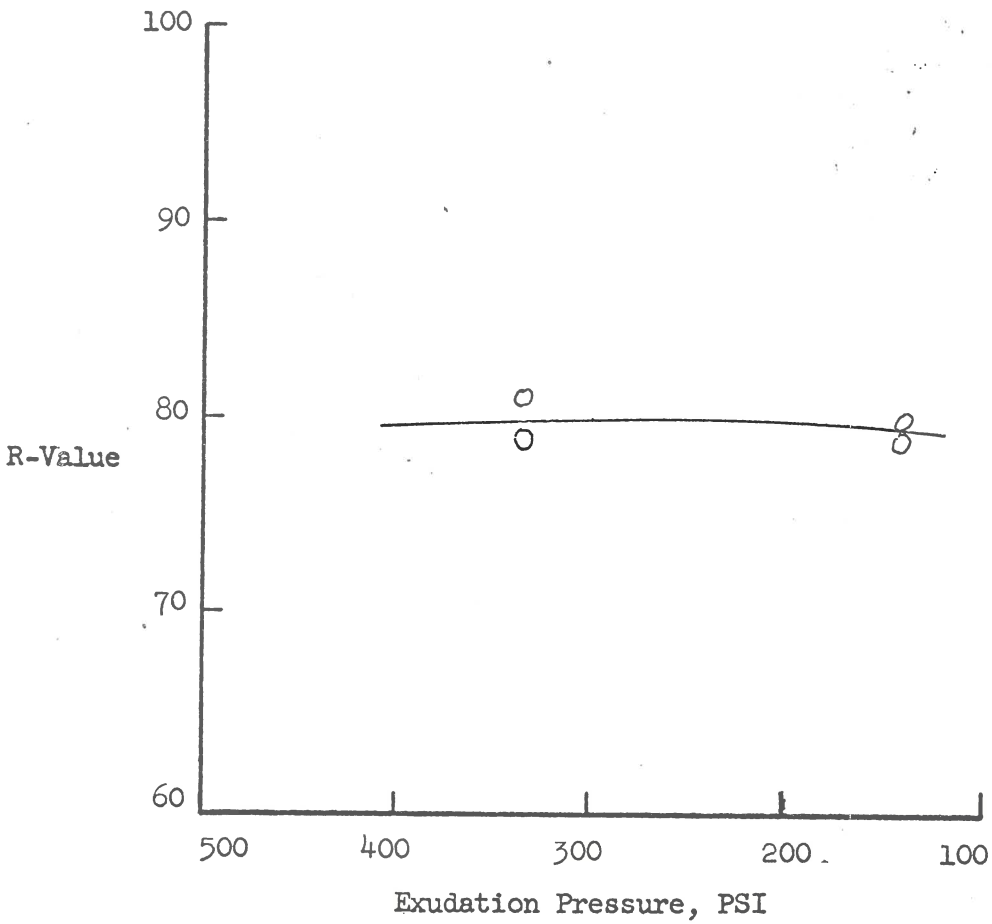




Summary of Data
California R-Value

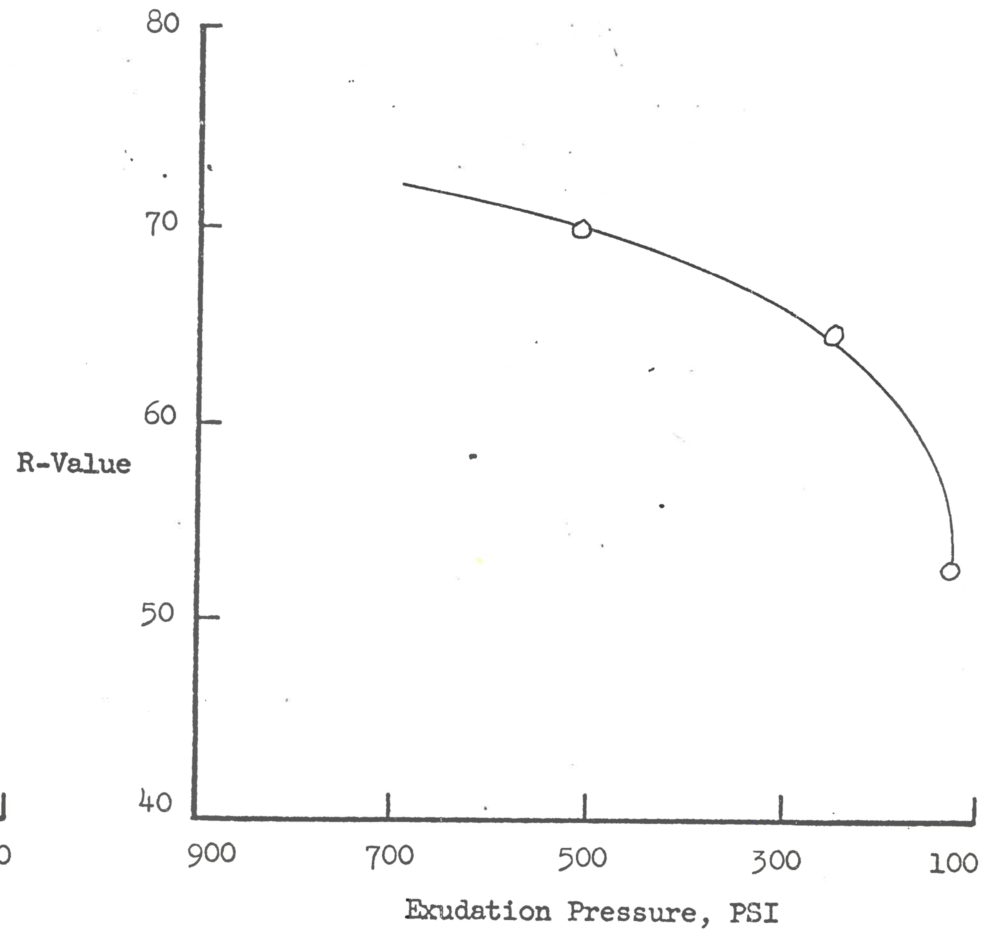
Sample No.: 120
Date Tested: 11-22-65
Visual Description: Red Sand

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



Sample No.: 121
Date Tested: 11-22-65
Visual Description: Red Sand

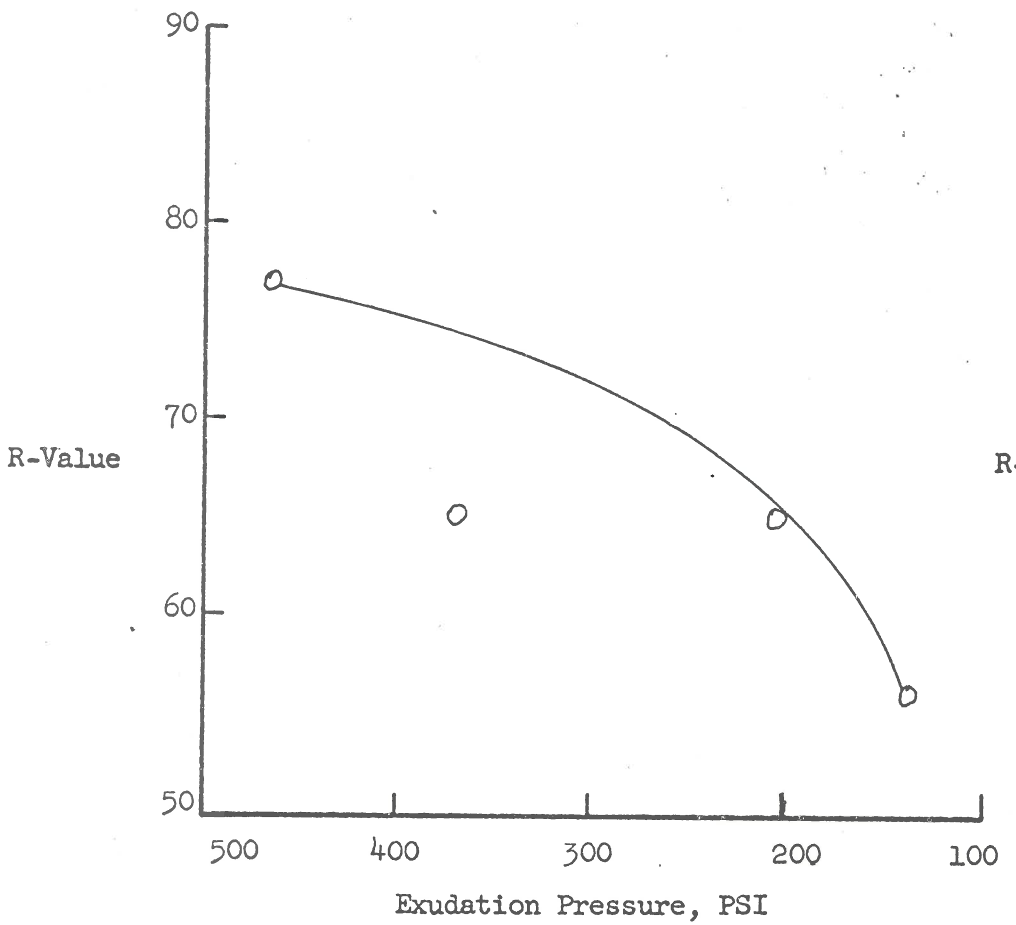
R-Value at 240 PSI: 65
R-Value at 300 PSI: 68



Summary of Data
California R-Value

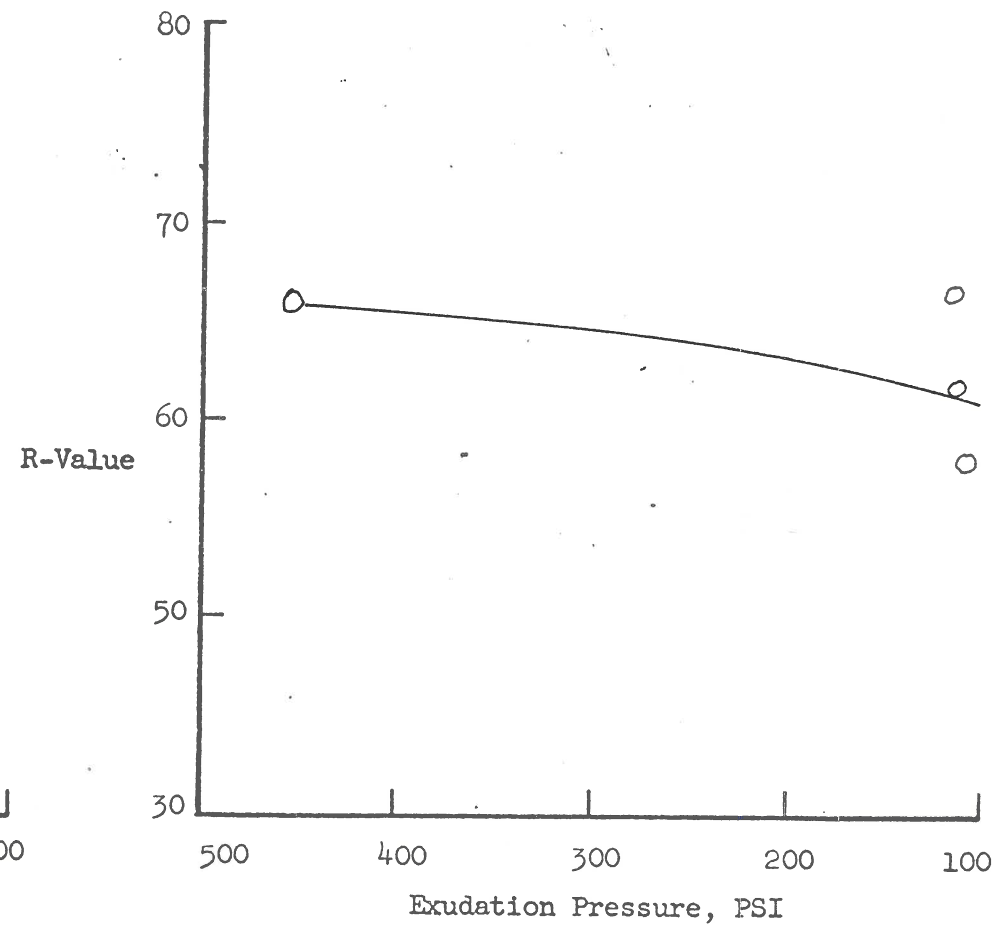
Sample No.: 122
Date Tested: 11-22-65
Visual Description: Tan Sand

R-Value at 240 PSI: 67
R-Value at 300 PSI: 72



Sample No.: 123
Date Tested: 11-22-65
Visual Description: Red Clayey Sand

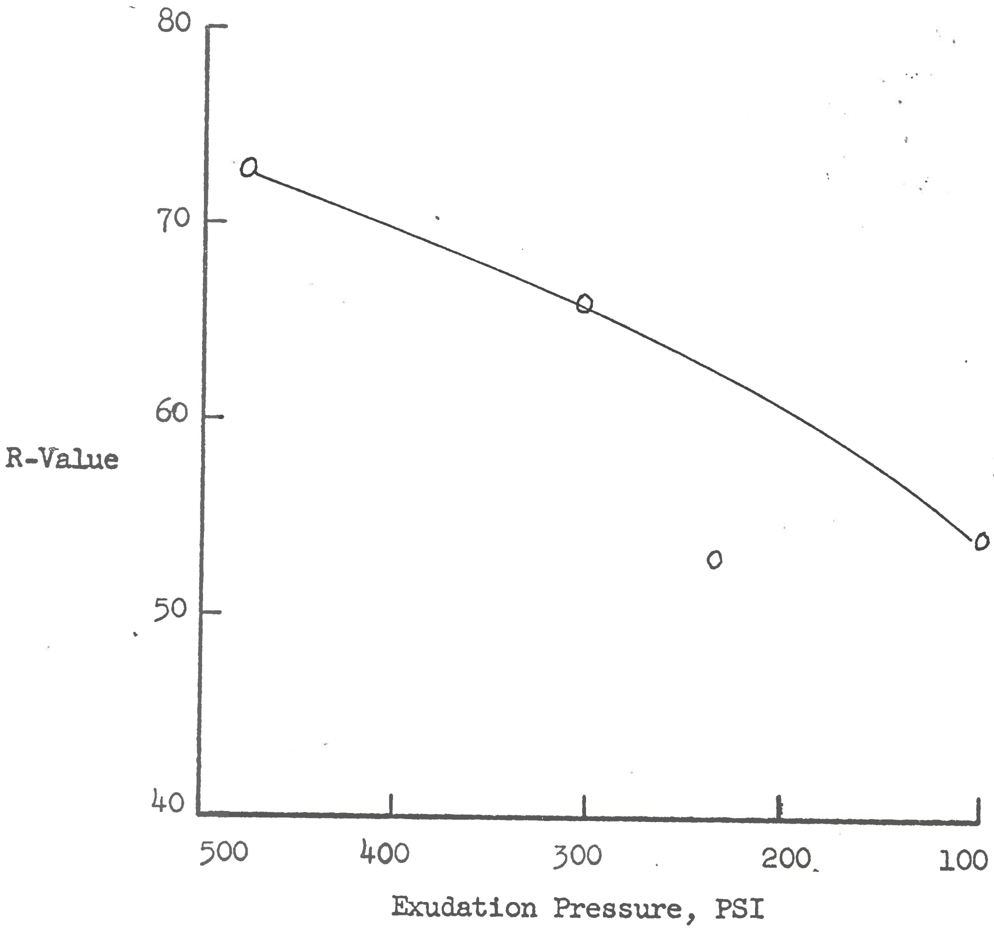
R-Value at 240 PSI: 63
R-Value at 300 PSI: 65



Summary of Data
California R-Value

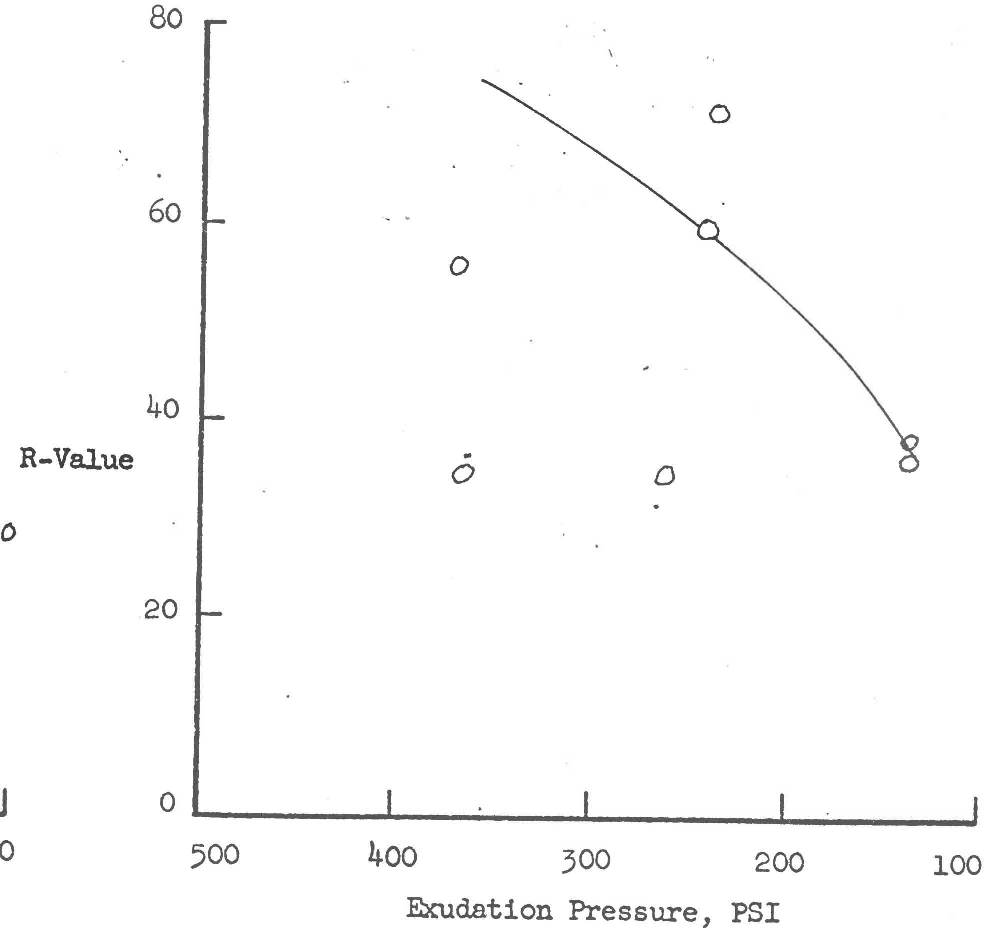
Sample No.: 124
Date Tested: 11-22-65
Visual Description: Red Sand

R-Value at 240 PSI: 63
R-Value at 300 PSI: 65



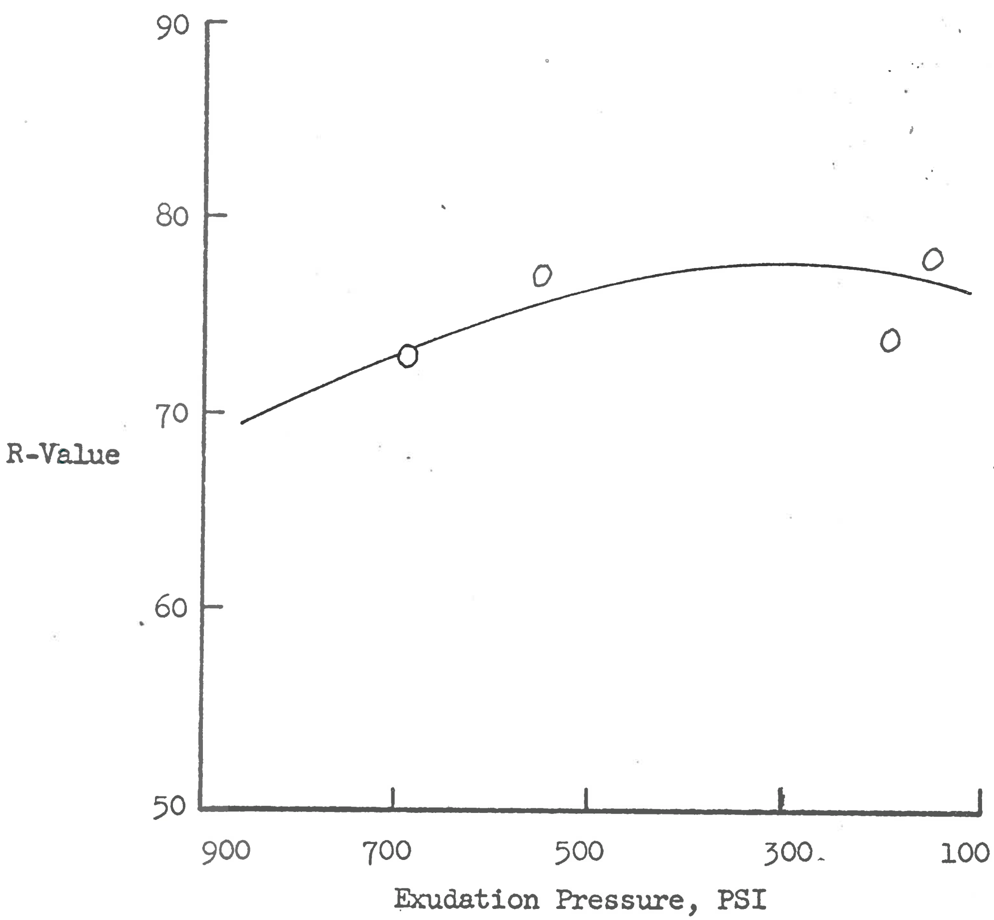
Sample No.: 125
Date Tested: 11-23-65
Visual Description: Red Clayey Sand

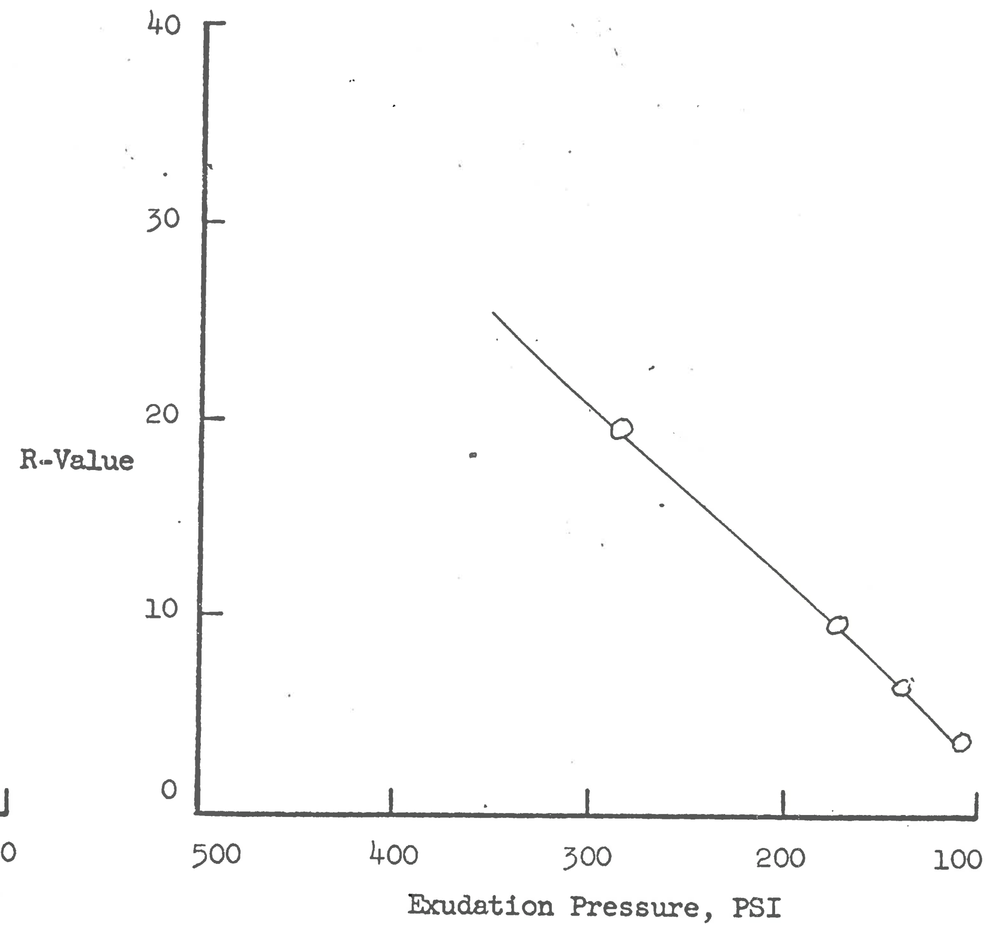
R-Value at 240 PSI: 60
R-Value at 300 PSI: 68



Summary of Data
California R-Value

Sample No.:	126	Sample No.:	127
Date Tested:	11-30-65	Date Tested:	11-23-65
Visual Description:	Red Sand	Visual Description:	Tan Clay
R-Value at 240 PSI:	77	R-Value at 240 PSI:	16
R-Value at 300 PSI:	78	R-Value at 300 PSI:	21

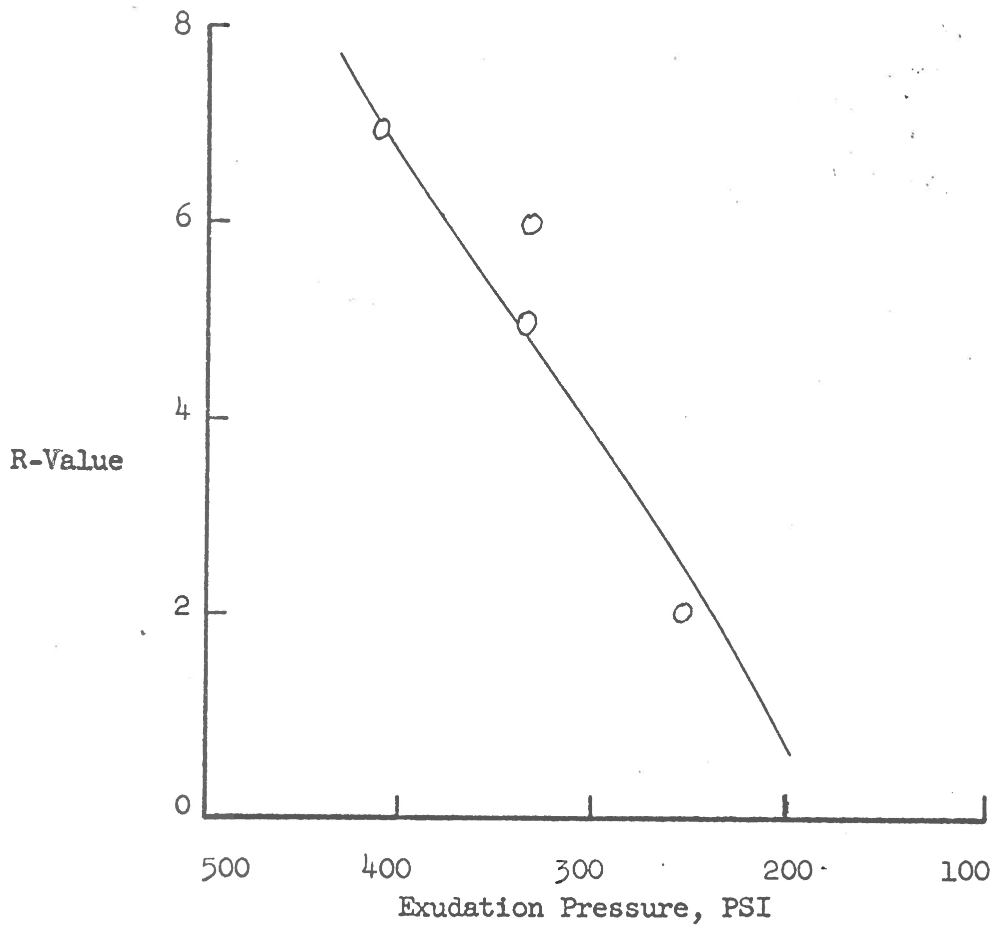




Summary of Data
California R-Value

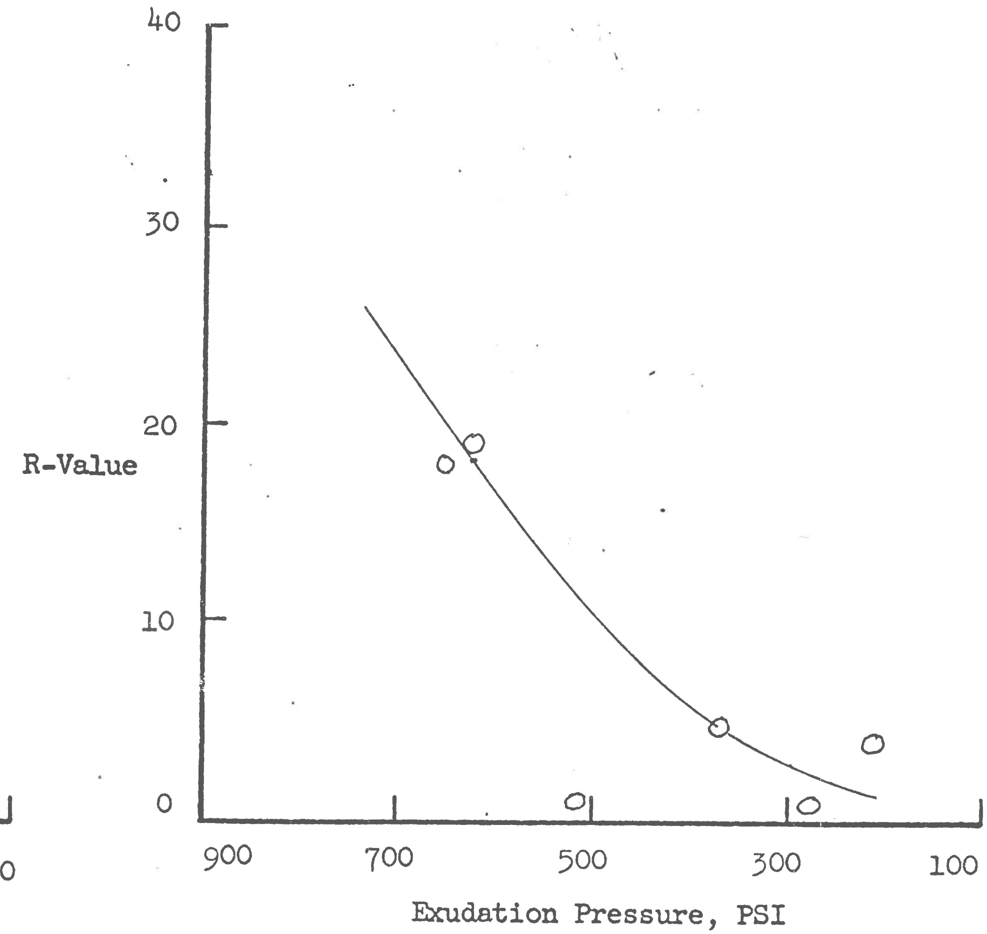
Sample No.: 128
Date Tested: 11-23-65
Visual Description: Brown Clay

R-Value at 240 PSI: 02
R-Value at 300 PSI: 04



Sample No.: 129
Date Tested: 11-30-65
Visual Description: Tan Sandy Clay

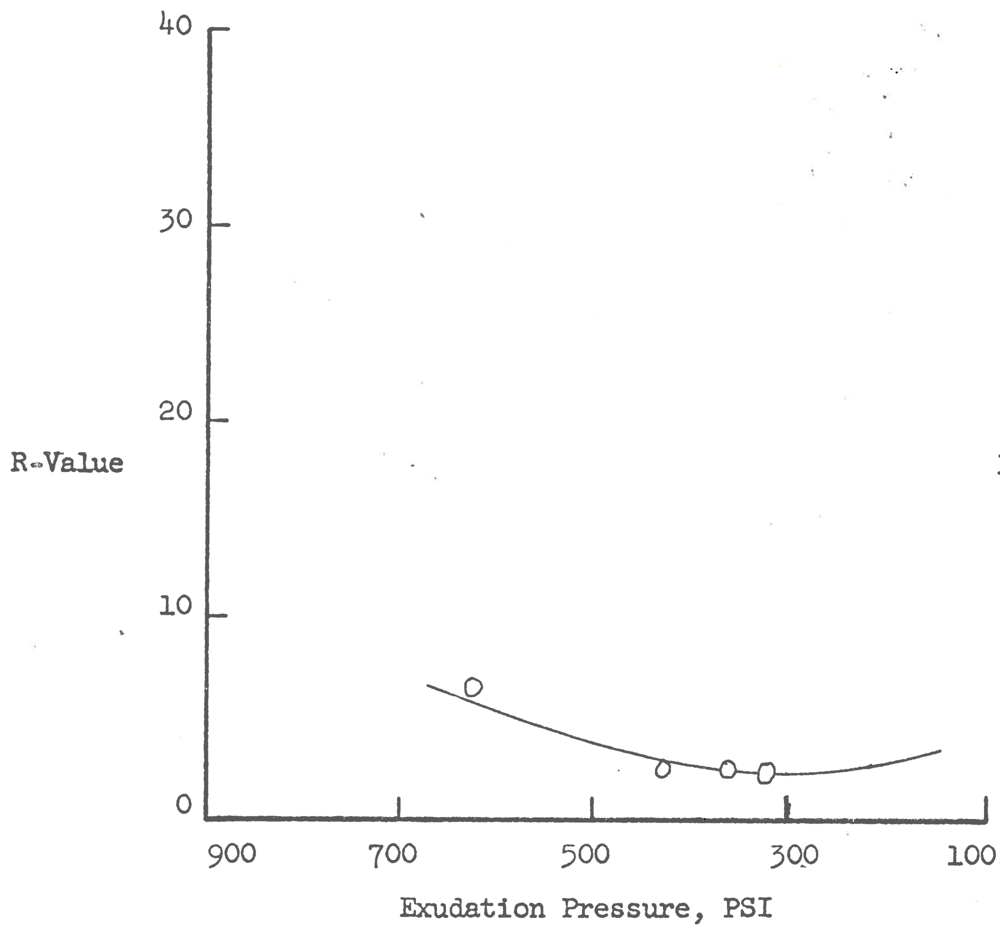
R-Value at 240 PSI: 02
R-Value at 300 PSI: 03



Summary of Data
California R-Value

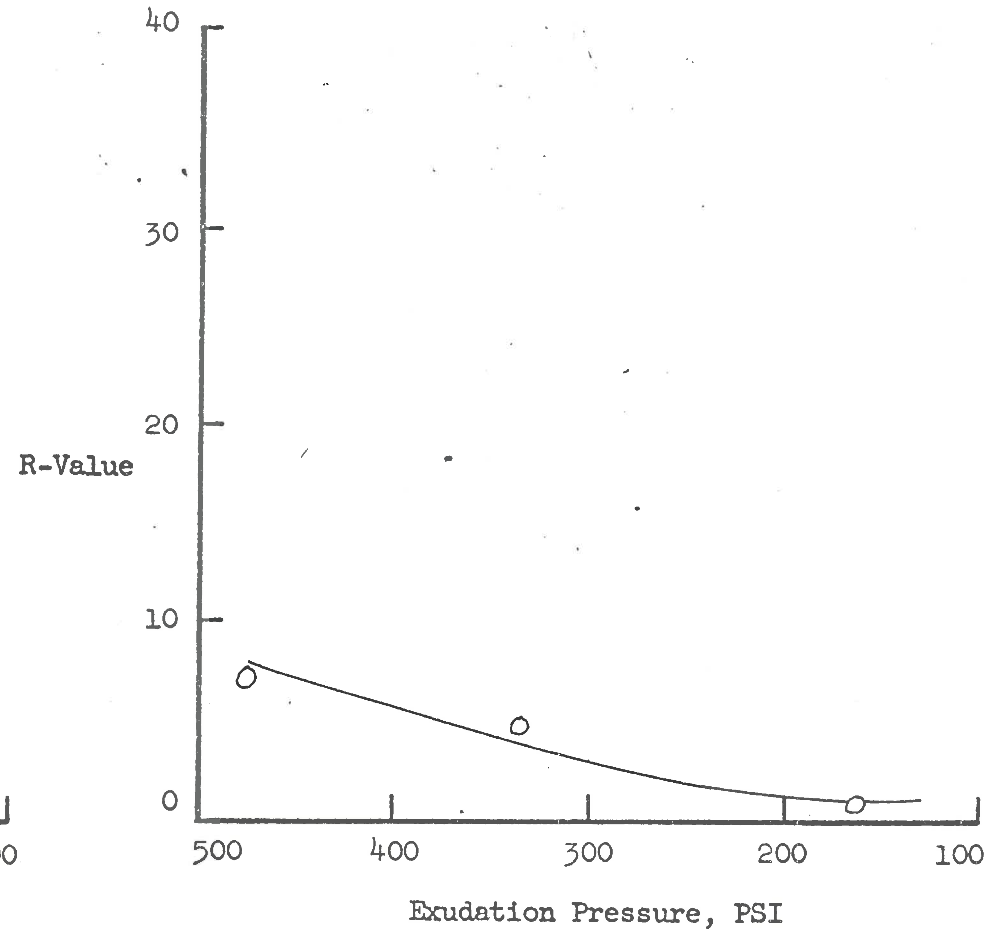
Sample No.: 130
Date Tested: 12-9-65
Visual Description: Brown Clay

R-Value at 240 PSI: 02
R-Value at 300 PSI: 02



Sample No.: 131
Date Tested: 11-30-65
Visual Description: Dark Tan Clay

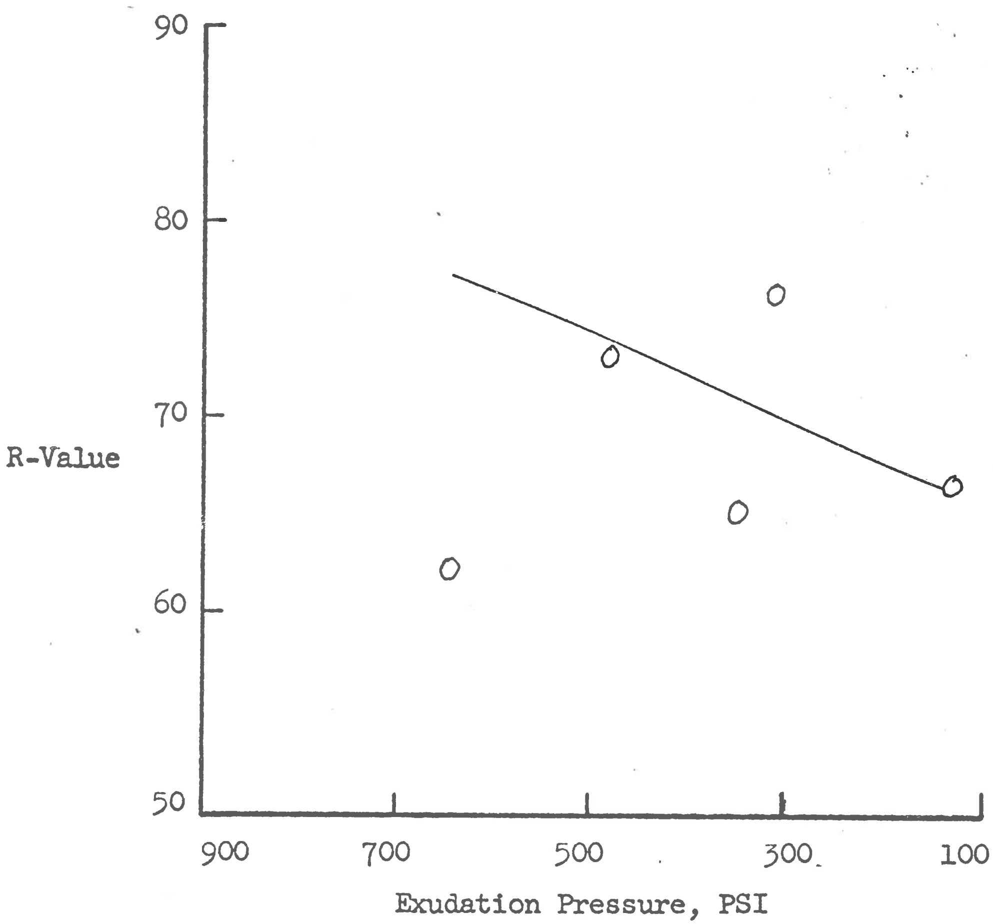
R-Value at 240 PSI: 02
R-Value at 300 PSI: 03



Summary of Data
California R-Value

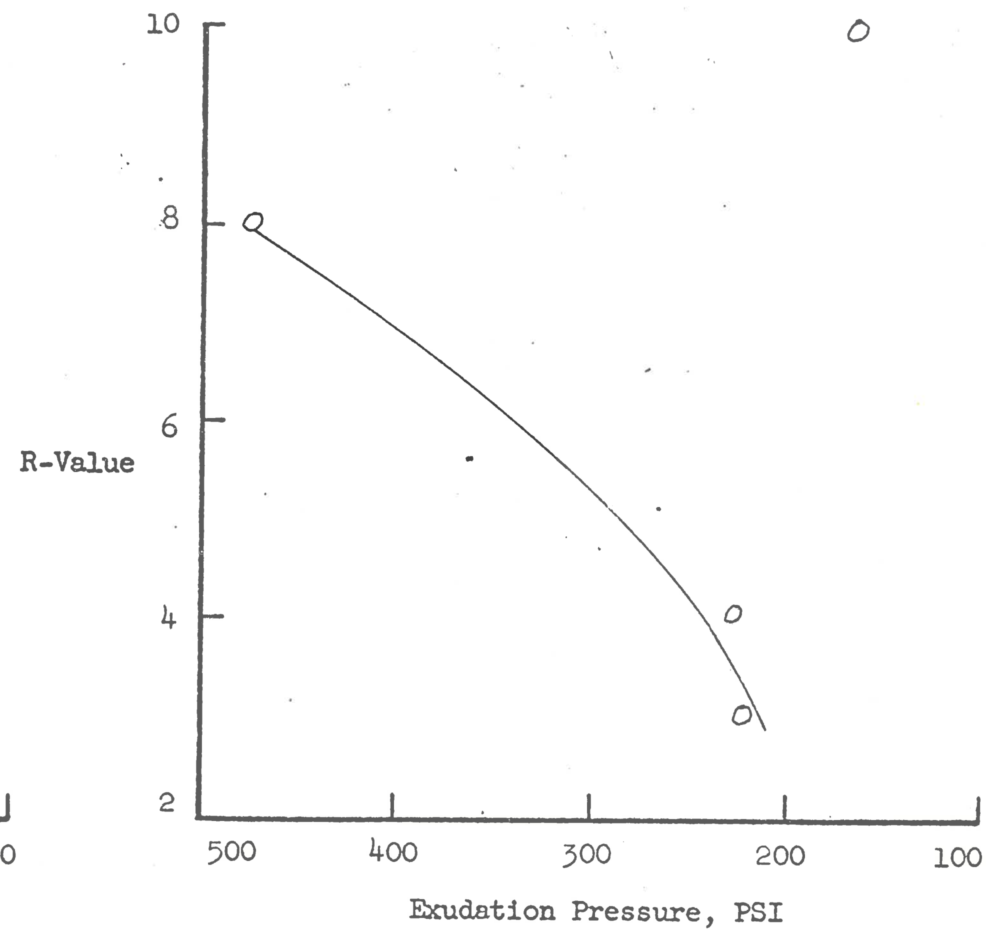
Sample No.: 132
Date Tested: 12-9-65
Visual Description: Tan Sand

R-Value at 240 PSI: 69
R-Value at 300 PSI: 70



Sample No.: 133
Date Tested: 12-9-65
Visual Description: Red Clay

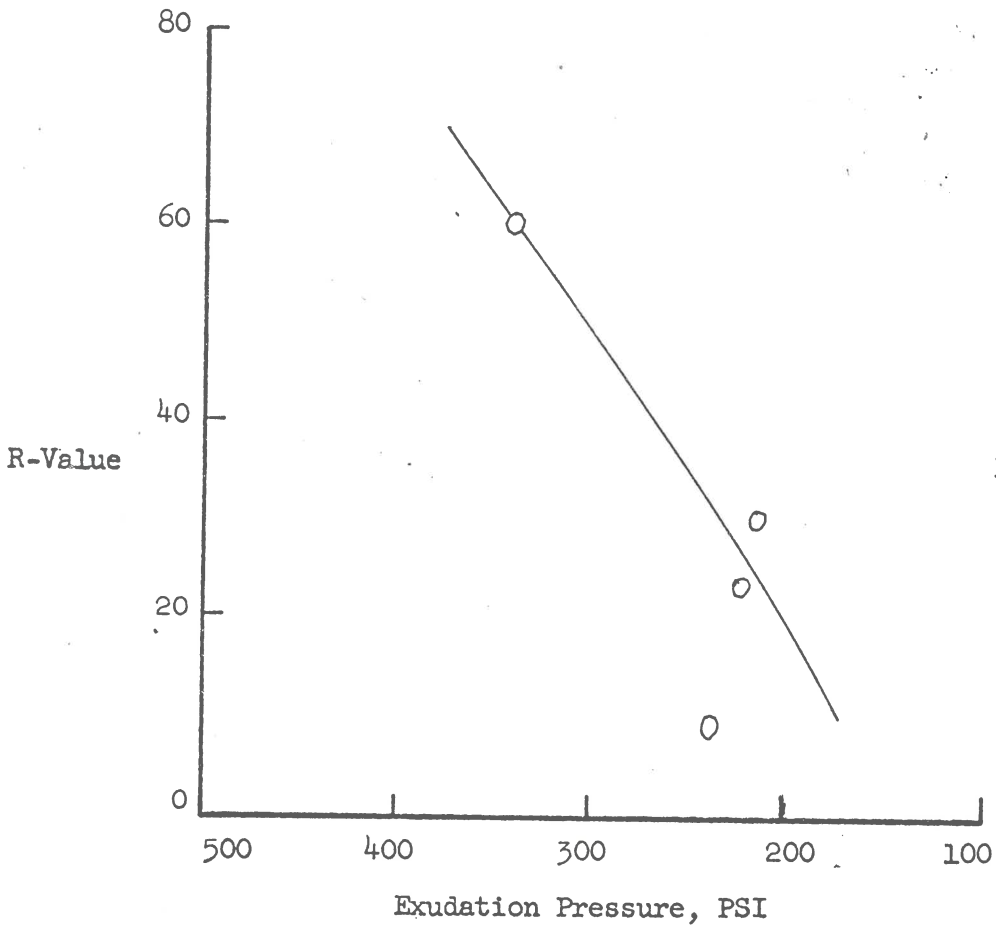
R-Value at 240 PSI: 04
R-Value at 300 PSI: 05



Summary of Data
California R-Value

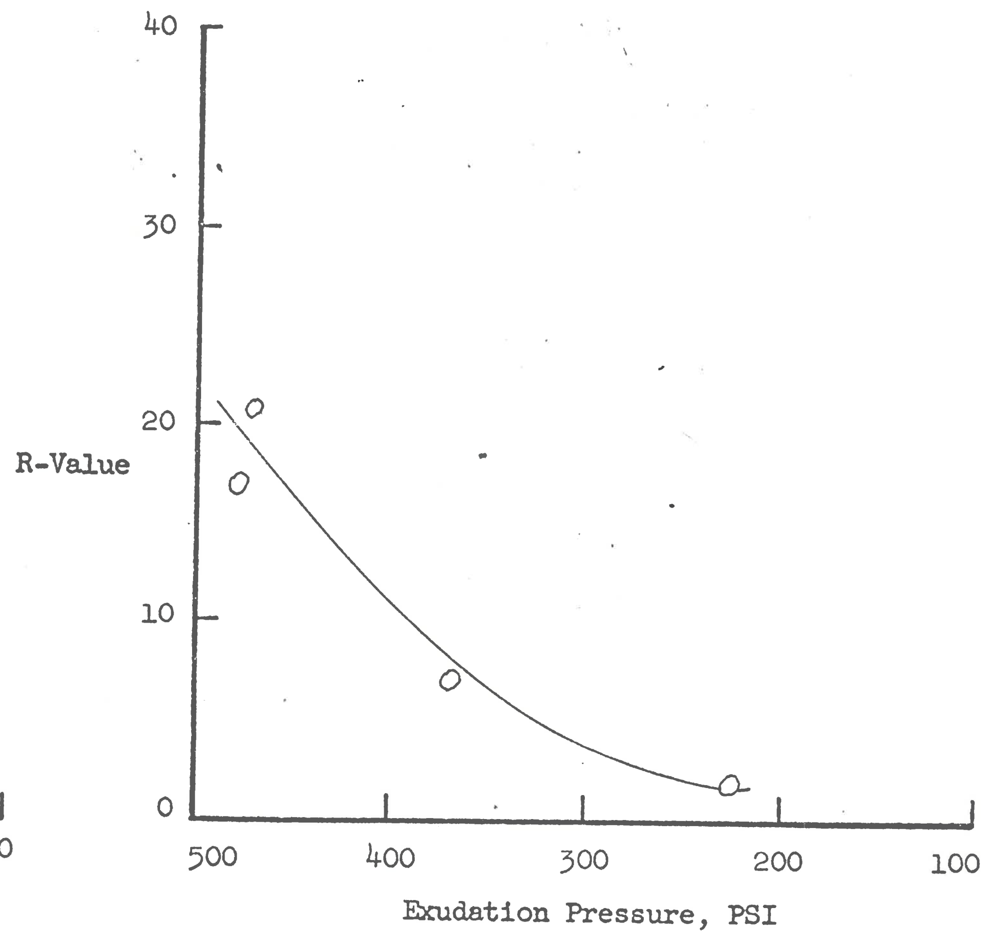
Sample No.: 134
Date Tested: 12-9-65
Visual Description: Gray Silt

R-Value at 240 PSI: 33
R-Value at 300 PSI: 50



Sample No.: 135
Date Tested: 12-9-65
Visual Description: Red Clay

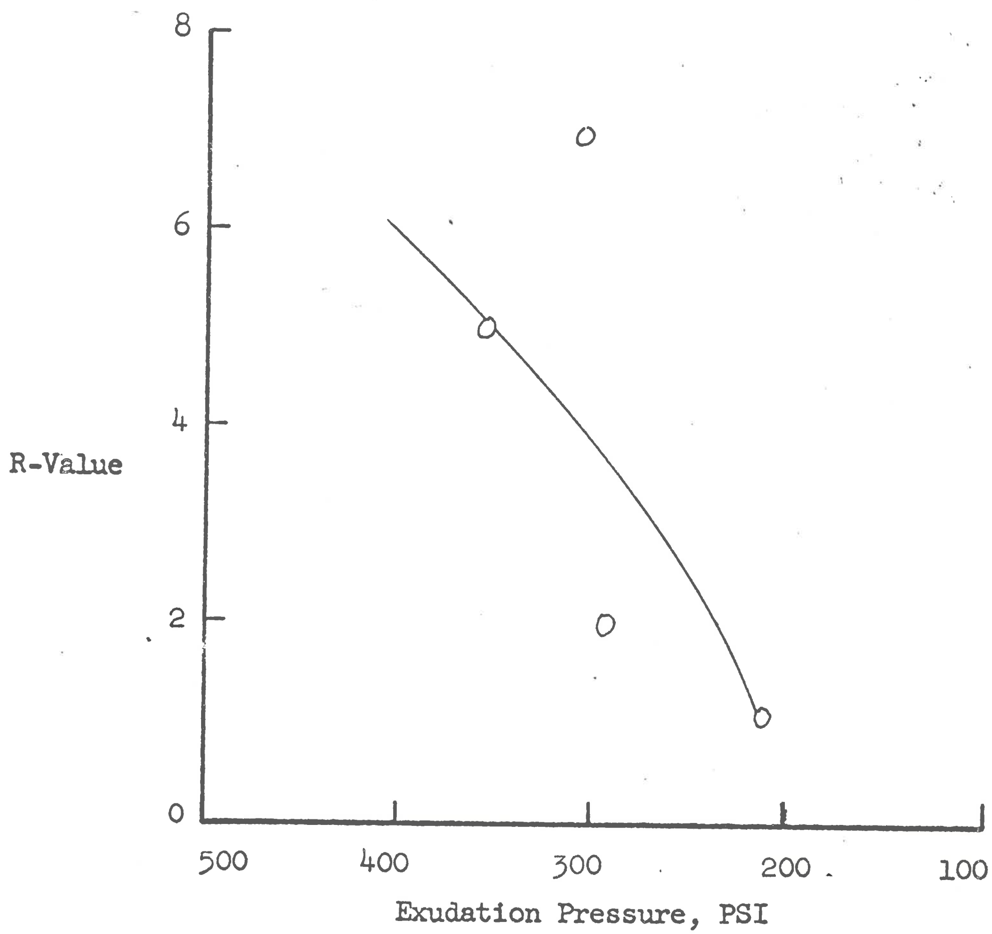
R-Value at 240 PSI: 02
R-Value at 300 PSI: 04



Summary of Data
California R-Value

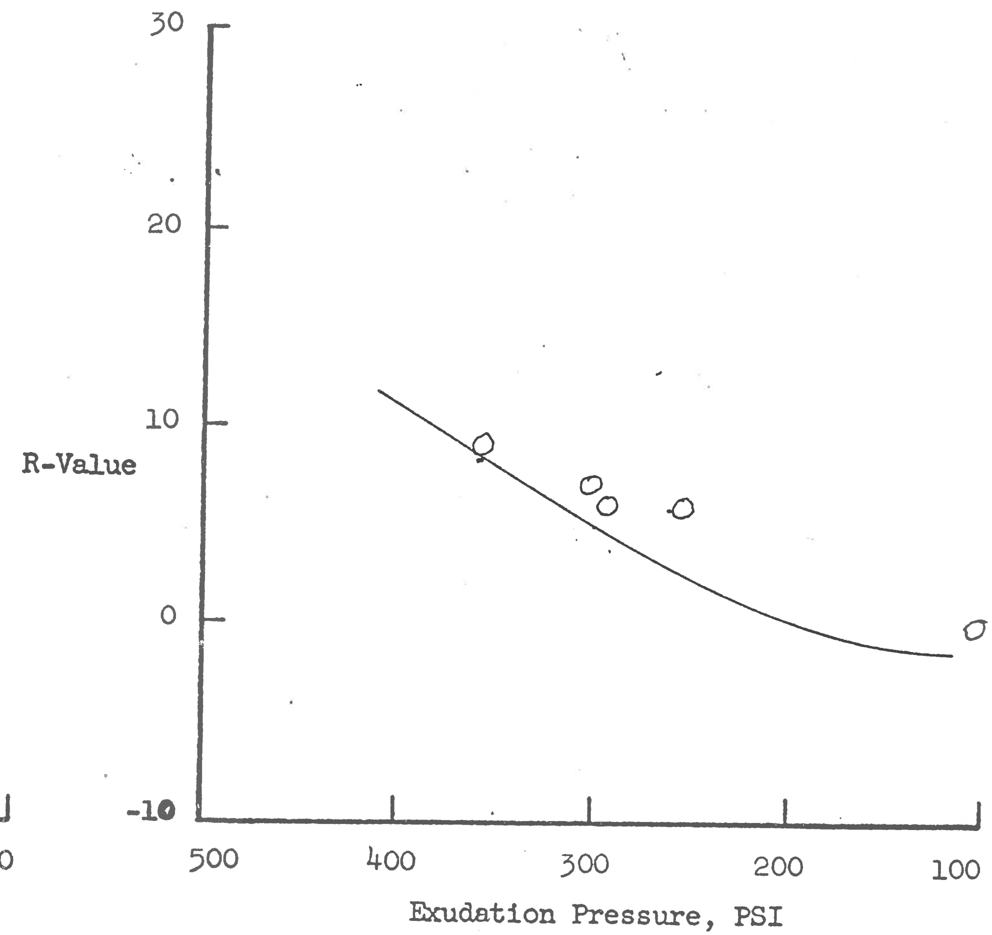
Sample No.: 136
Date Tested: 12-22-65
Visual Description: Light Brown Clay

R-Value at 240 PSI: 02
R-Value at 300 PSI: 04



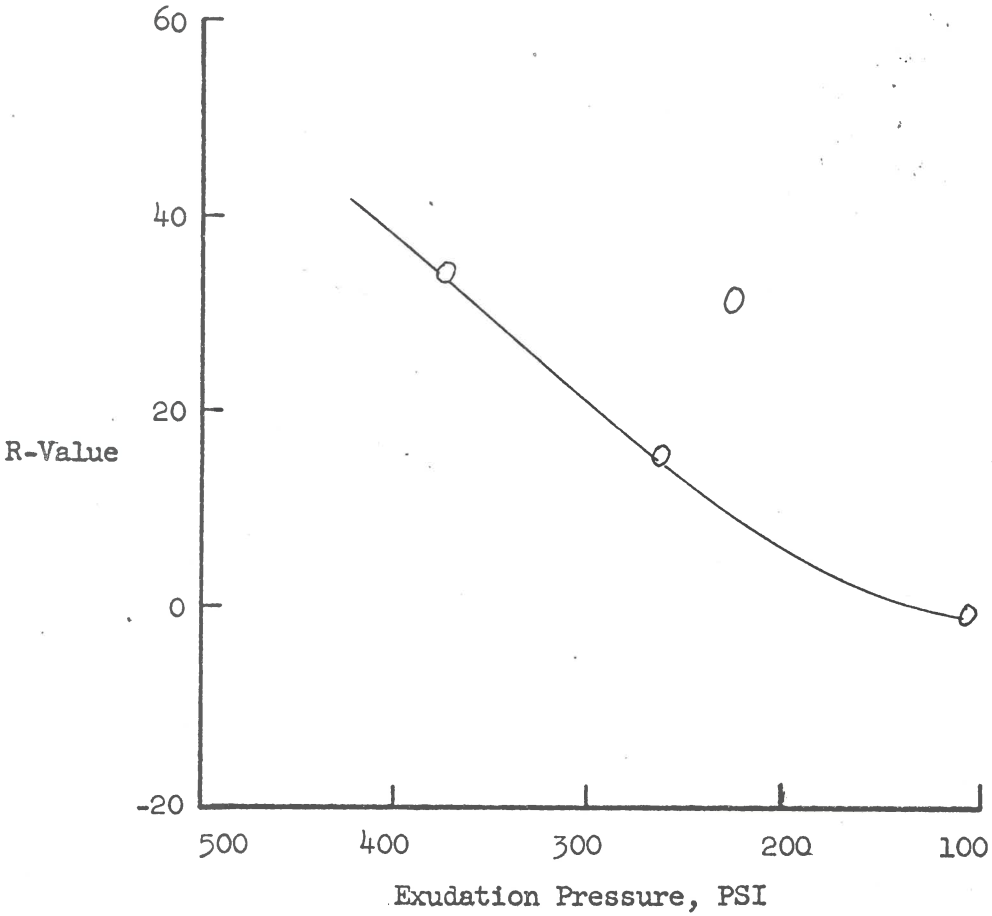
Sample No.: 137
Date Tested: 12-22-65
Visual Description: Tan Clay

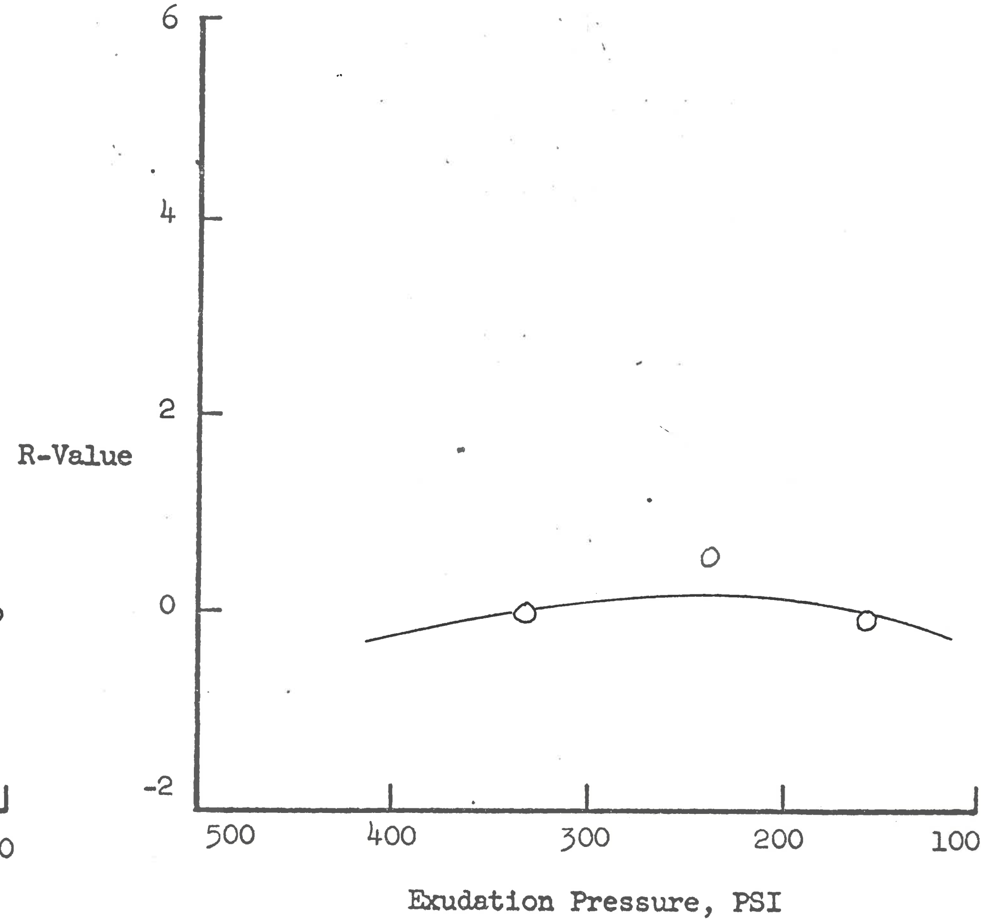
R-Value at 240 PSI: 01
R-Value at 300 PSI: 05



Summary of Data
California R-Value

Sample No.:	138		Sample No.:	139
Date Tested:	12-9-65		Date Tested:	1-5-66
Visual Description:	Tan Clay		Visual Description:	Tan Clay
R-Value at 240 PSI:	12		R-Value at 240 PSI:	01
R-Value at 300 PSI:	21		R-Value at 300 PSI:	01

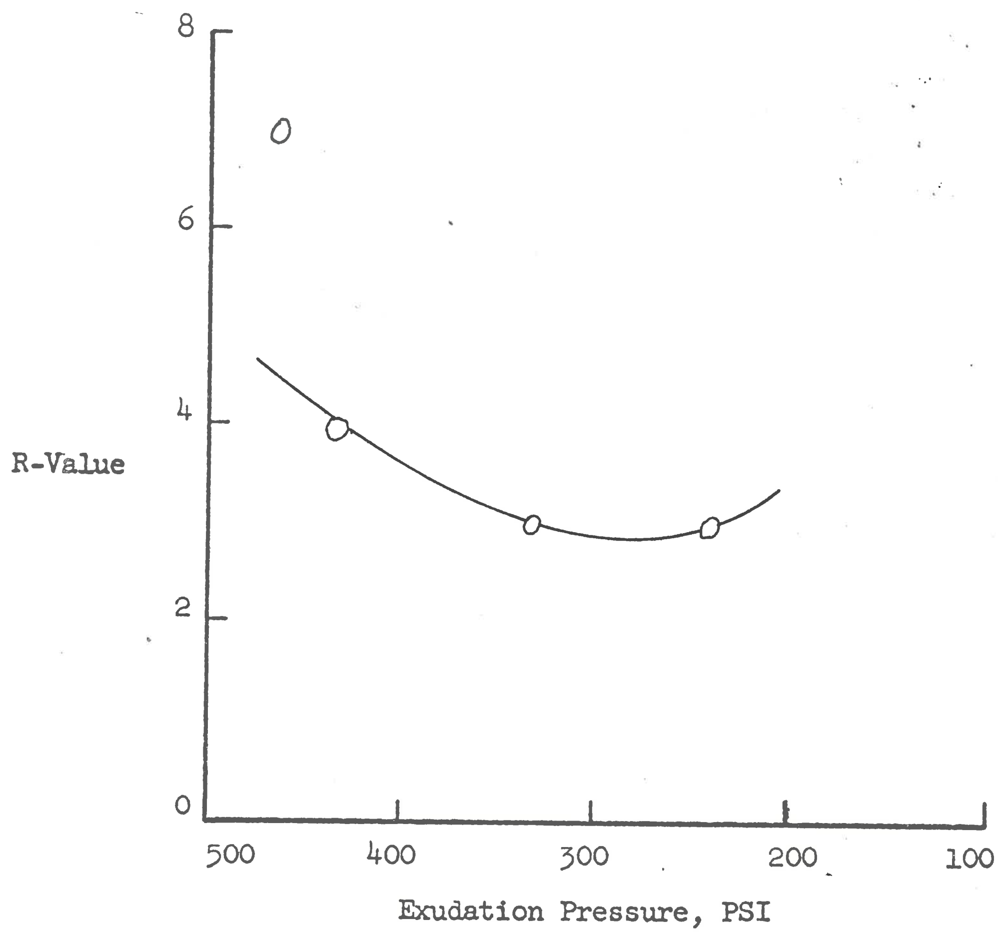




Summary of Data
California R-Value

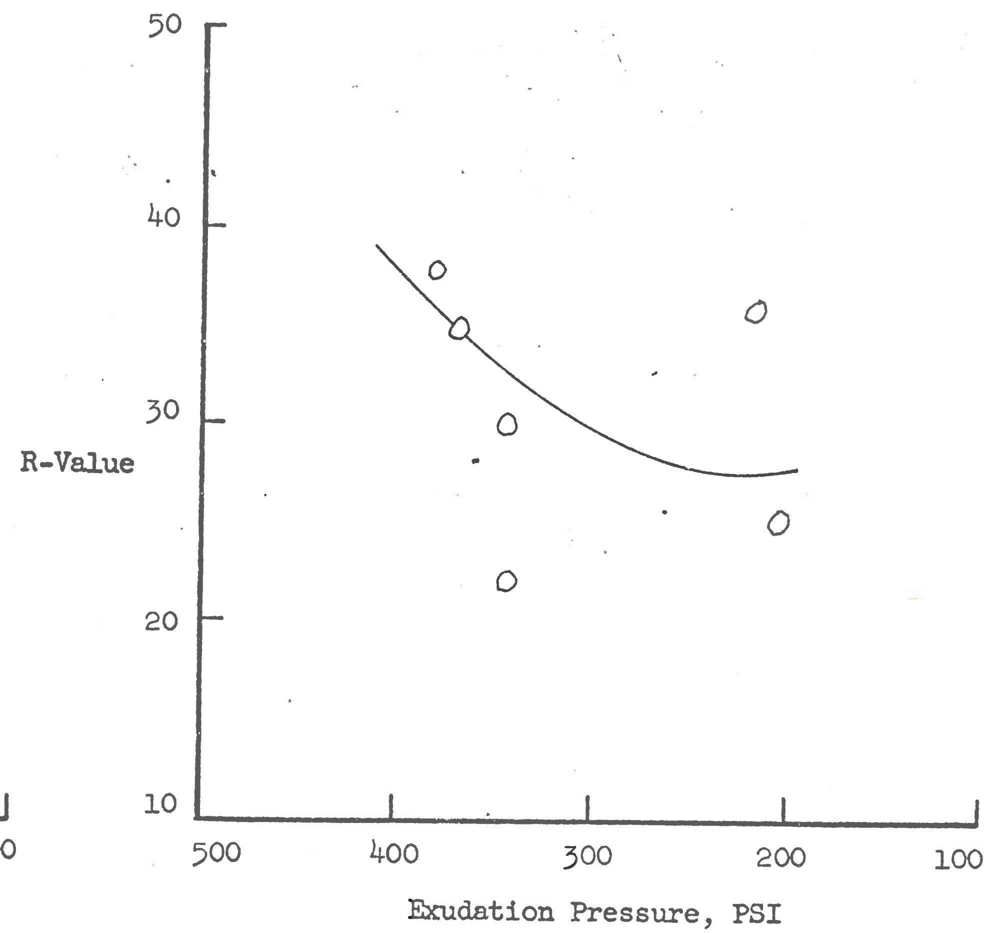
Sample No.: 140
Date Tested: 12-9-65
Visual Description: Dark Tan Clay

R-Value at 240 PSI: 03
R-Value at 300 PSI: 03



Sample No.: 141
Date Tested: 12-9-65
Visual Description: Tan Clayey Sand

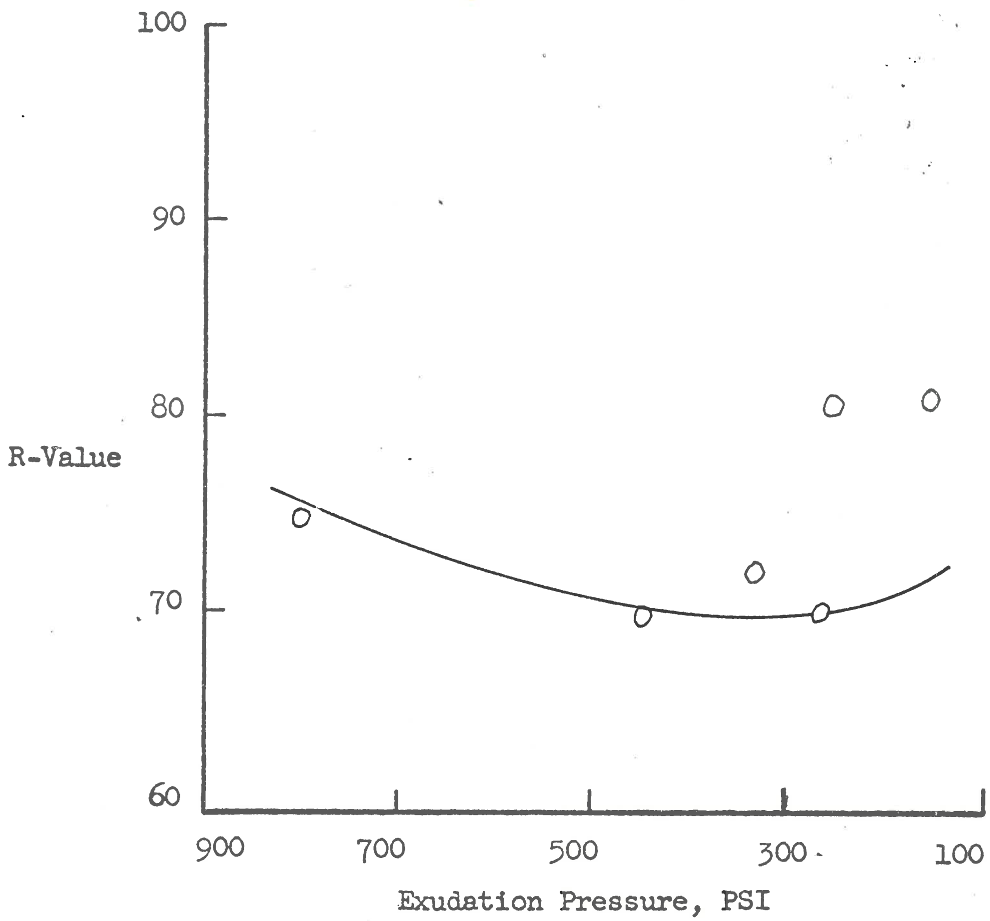
R-Value at 240 PSI: 27
R-Value at 300 PSI: 30



Summary of Data
California R-Value

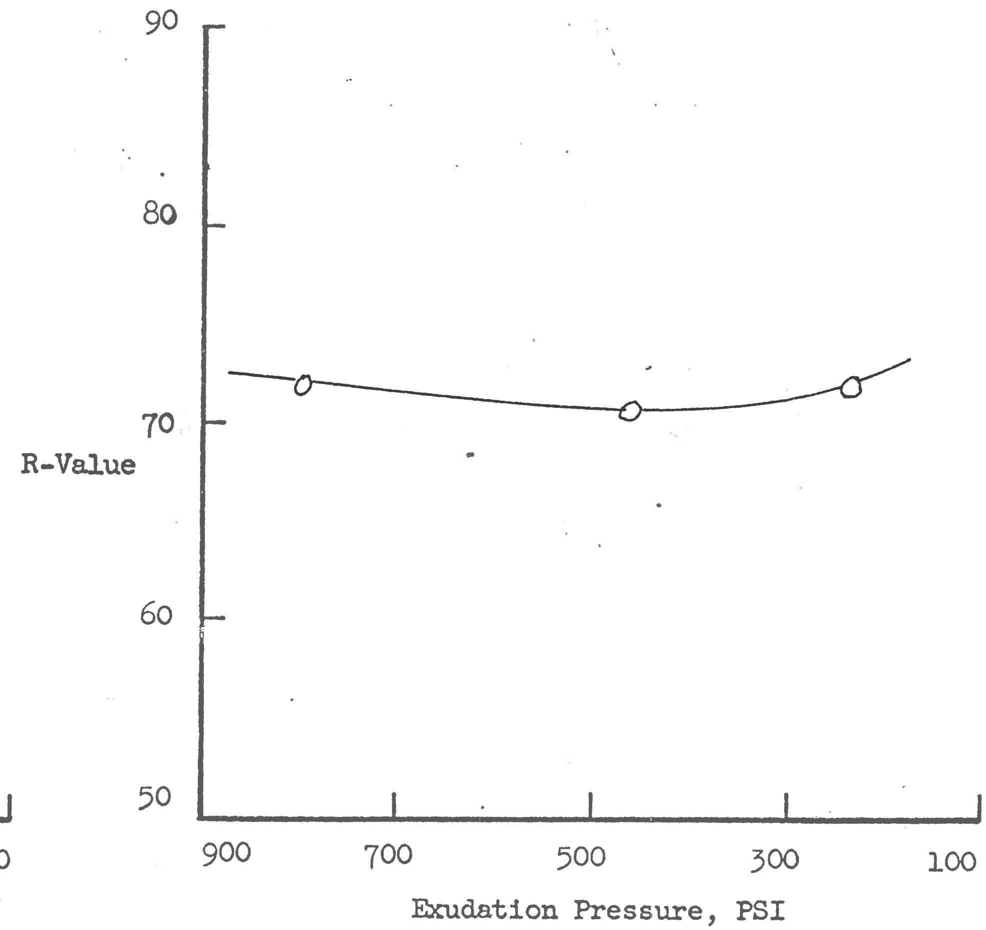
Sample No.: 142
Date Tested: 12-13-65
Visual Description: Brown Sand

R-Value at 240 PSI: 70
R-Value at 300 PSI: 70



Sample No.: 152
Date Tested: 12-13-65
Visual Description: Tan Sand

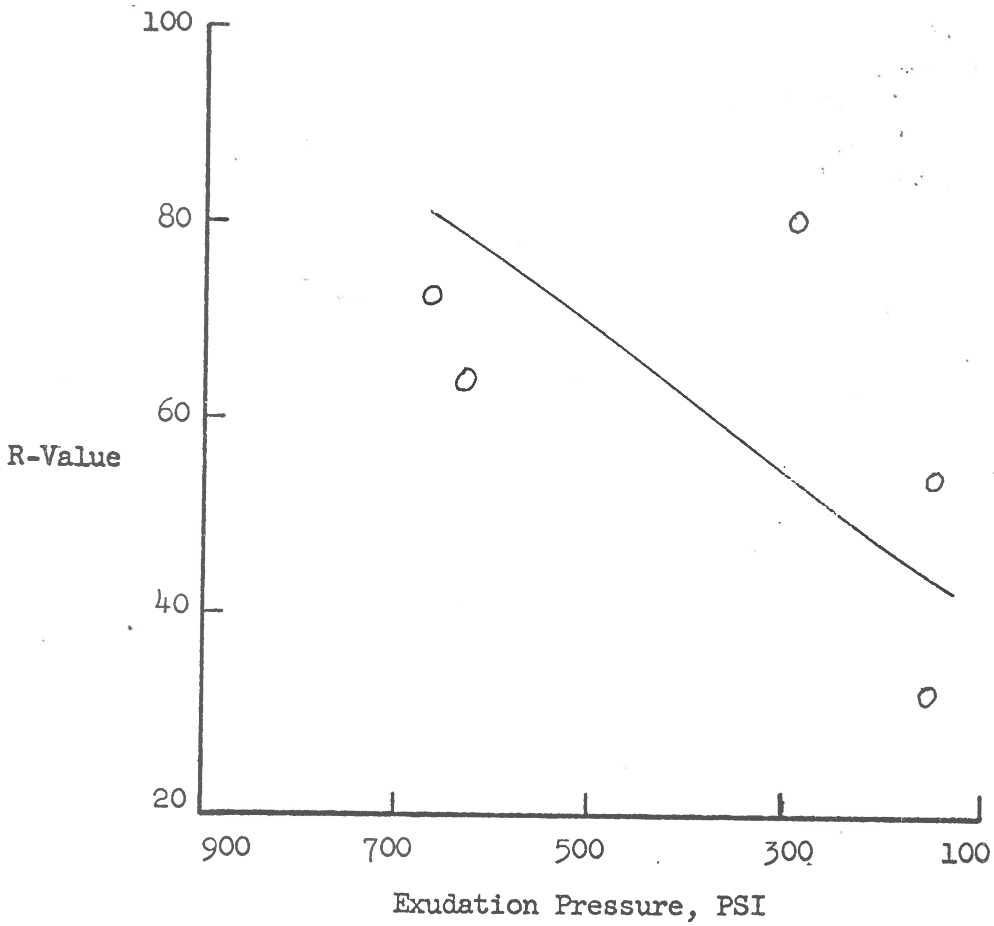
R-Value at 240 PSI: 72
R-Value at 300 PSI: 72



Summary of Data
California R-Value

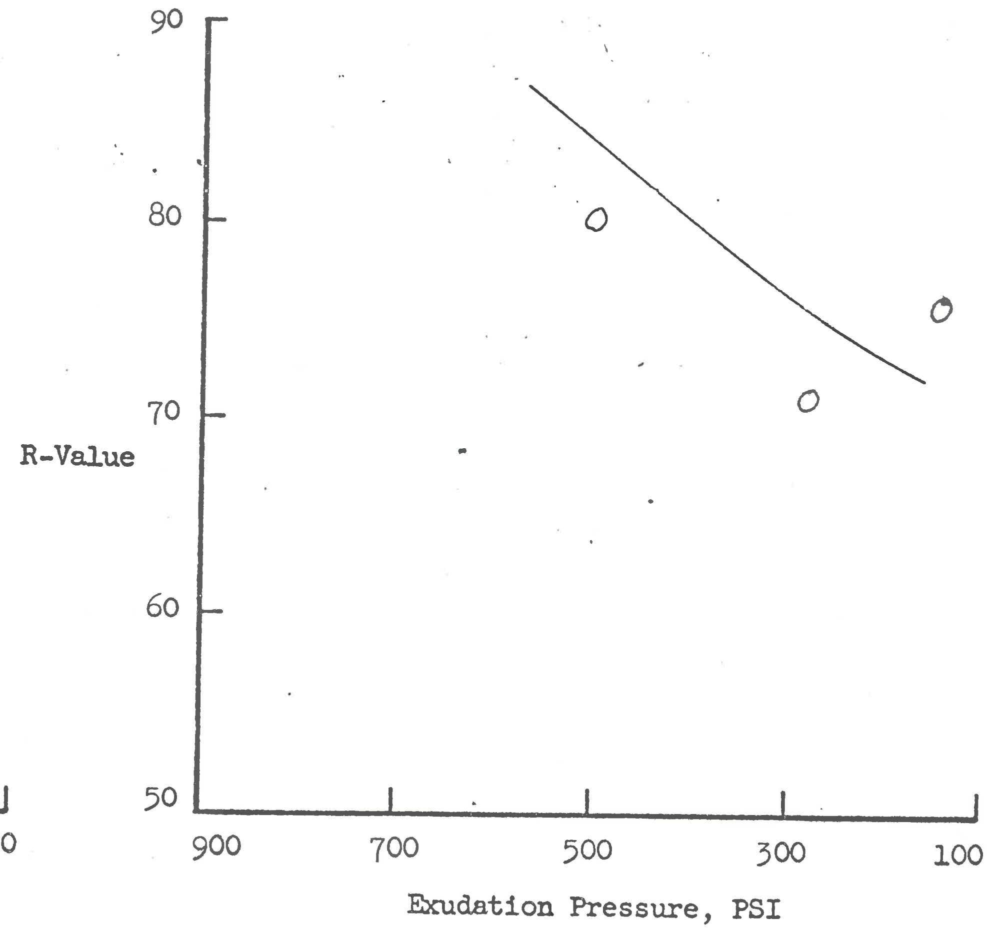
Sample No.: 154
Date Tested: 2-8-66
Visual Description: Red Clay with Gravel

R-Value at 240 PSI: 51
R-Value at 300 PSI: 55



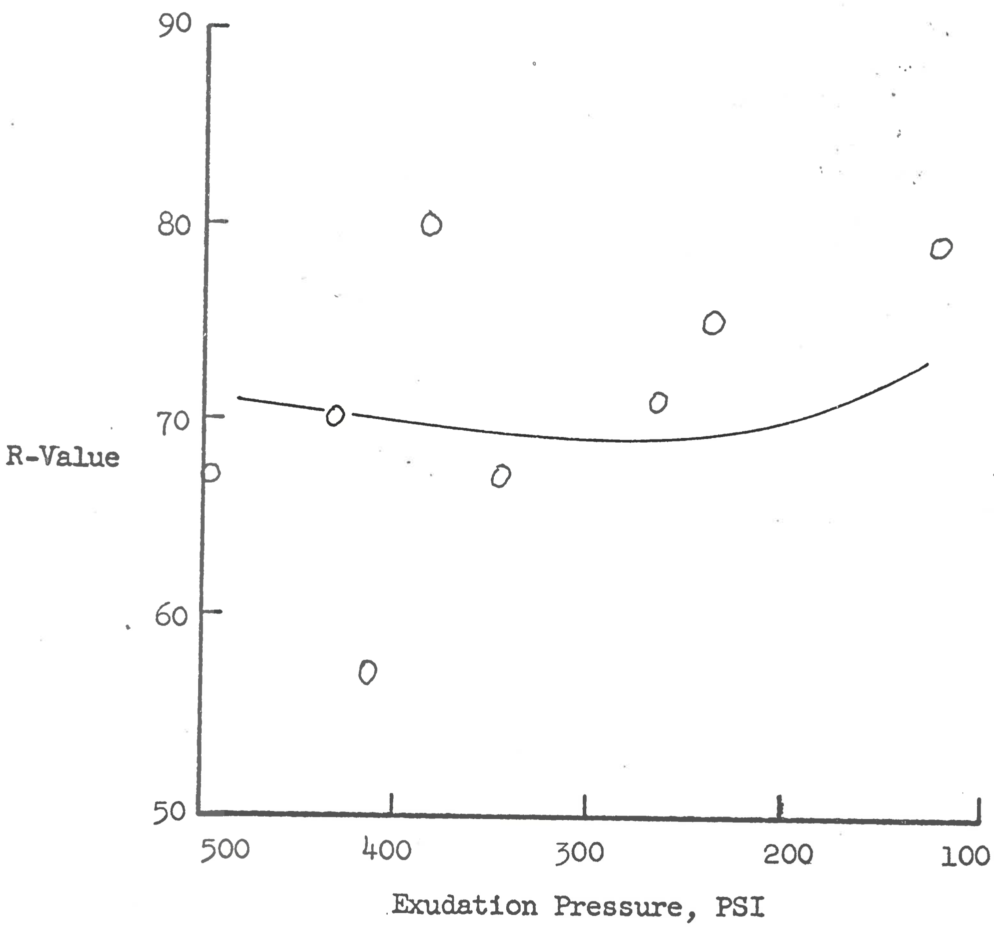
Sample No.: 155
Date Tested: 12-22-65
Visual Description: Dark Tan Clay with Gravel

R-Value at 240 PSI: 75
R-Value at 300 PSI: 77

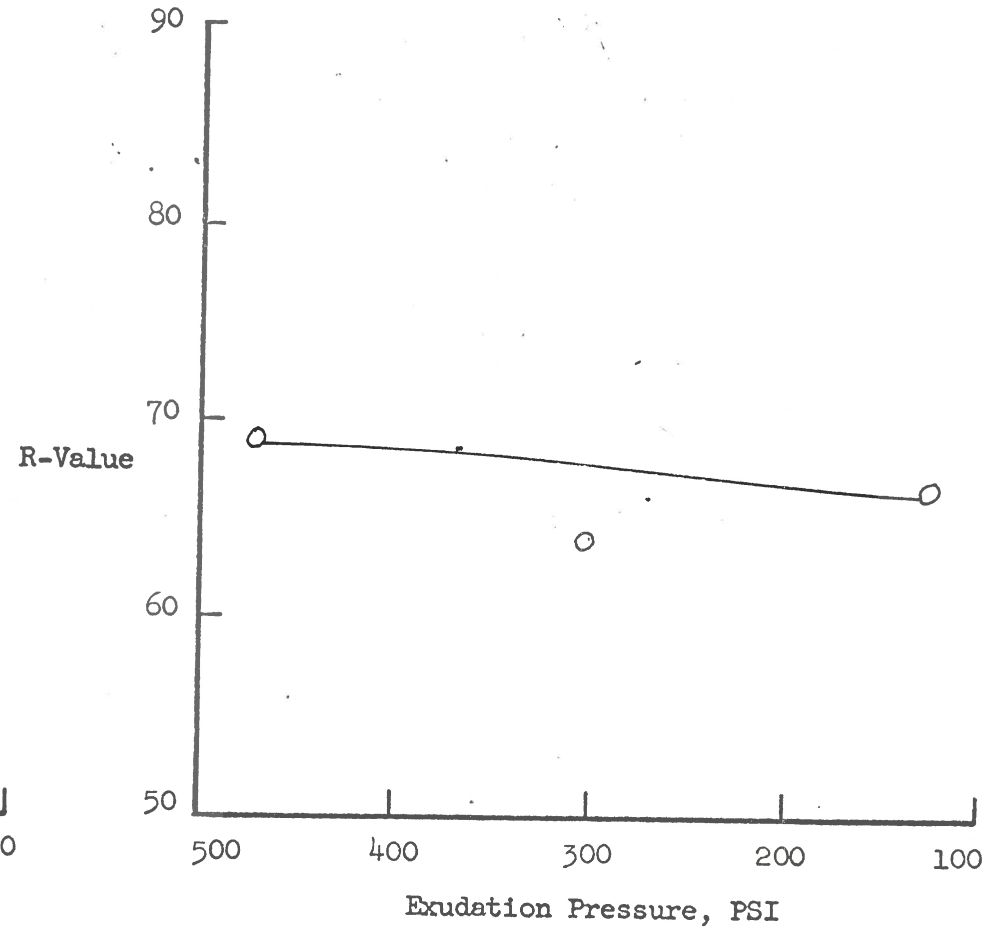


Summary of Data
California R-Value

Sample No.:	156
Date Tested:	1-13-65
Visual Description:	Tan Clayey Sand
R-Value at 240 PSI:	69
R-Value at 300 PSI:	69



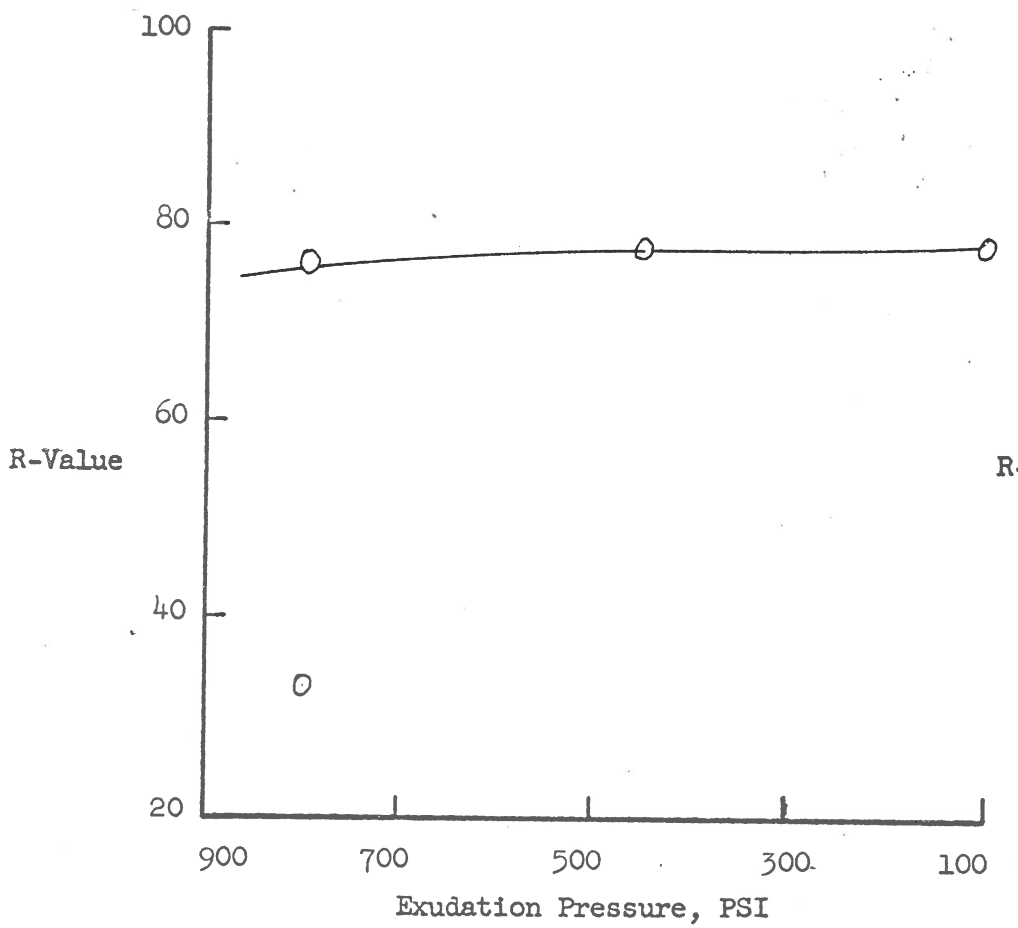
Sample No.:	157
Date Tested:	3-8-66
Visual Description:	Brown Sandy Gravel
R-Value at 240 PSI:	67
R-Value at 300 PSI:	68



Summary of Data
California R-Value

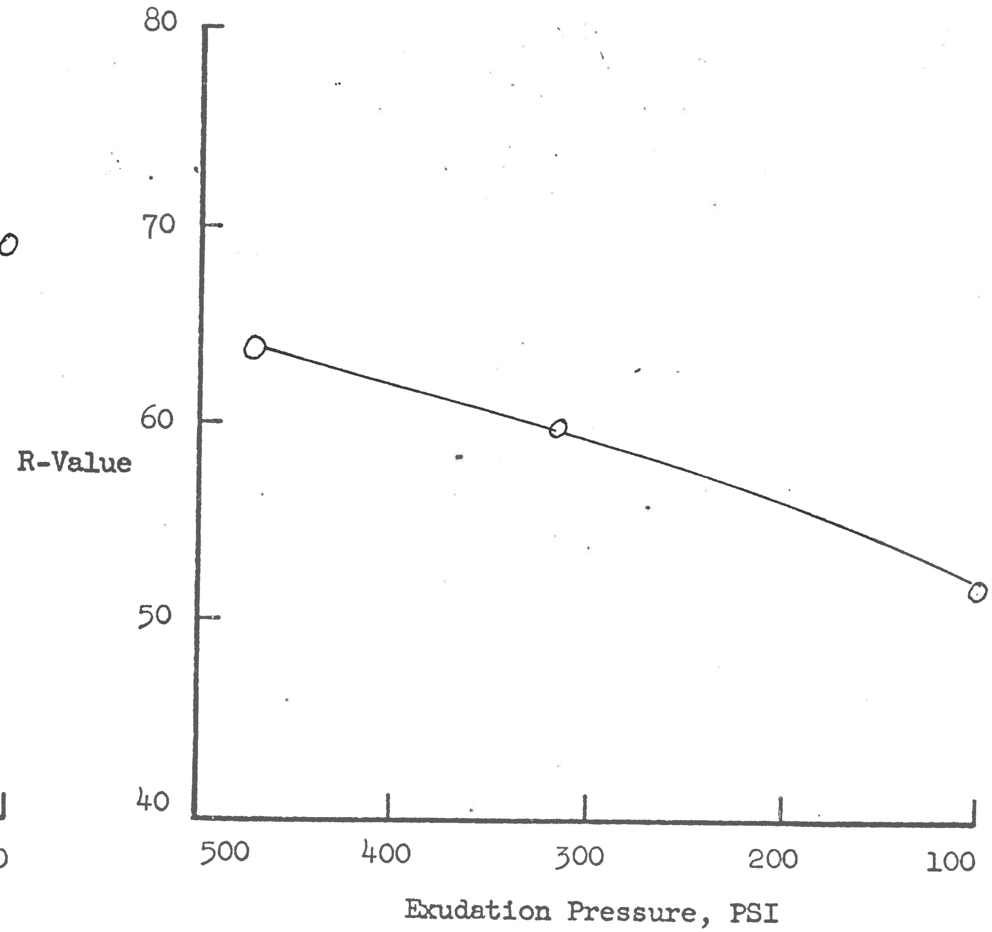
Sample No.: 158
Date Tested: 1-3-66
Visual Description: Tan Sandy Gravel

R-Value at 240 PSI: 78
R-Value at 300 PSI: 78



Sample No.: 159
Date Tested: 2-8-66
Visual Description: Brown Sand

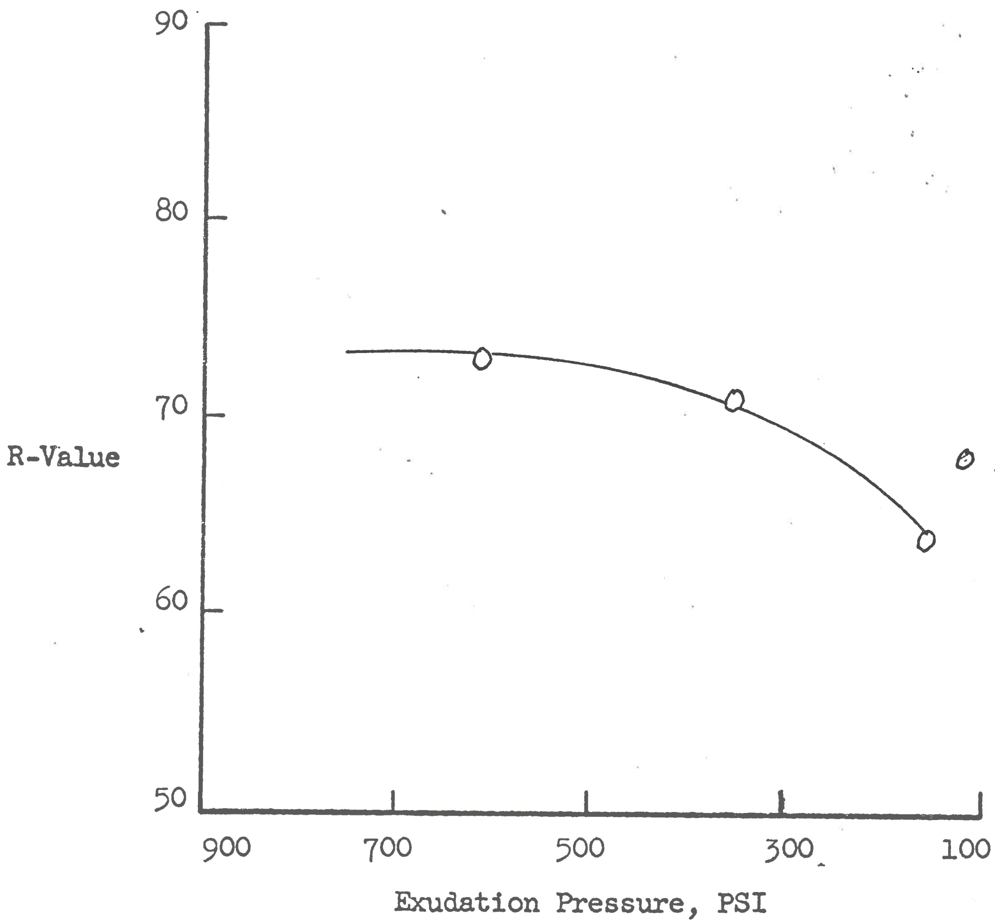
R-Value at 240 PSI: 57
R-Value at 300 PSI: 60



Summary of Data
California R-Value

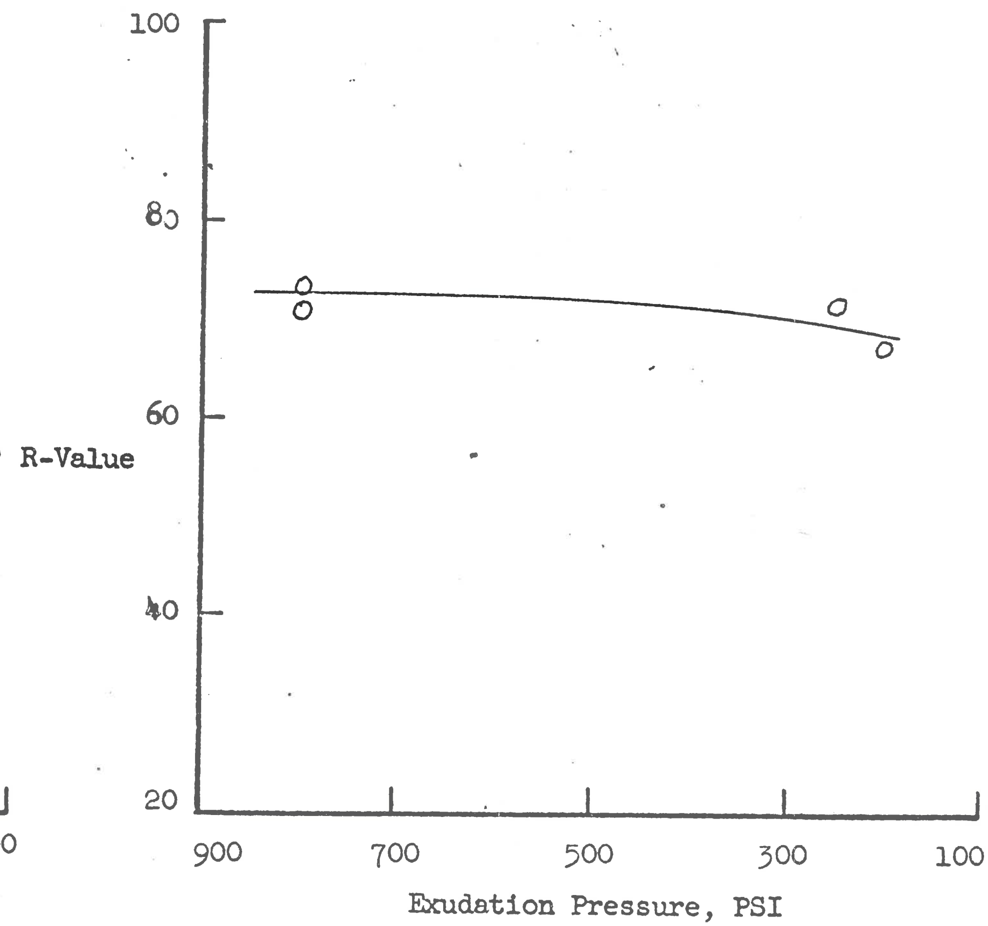
Sample No.: 160
Date Tested: 1-3-66
Visual Description: Brown Sand

R-Value at 240 PSI: 69
R-Value at 300 PSI: 70



Sample No.: 161
Date Tested: 1-13-65
Visual Description: Brown Sand

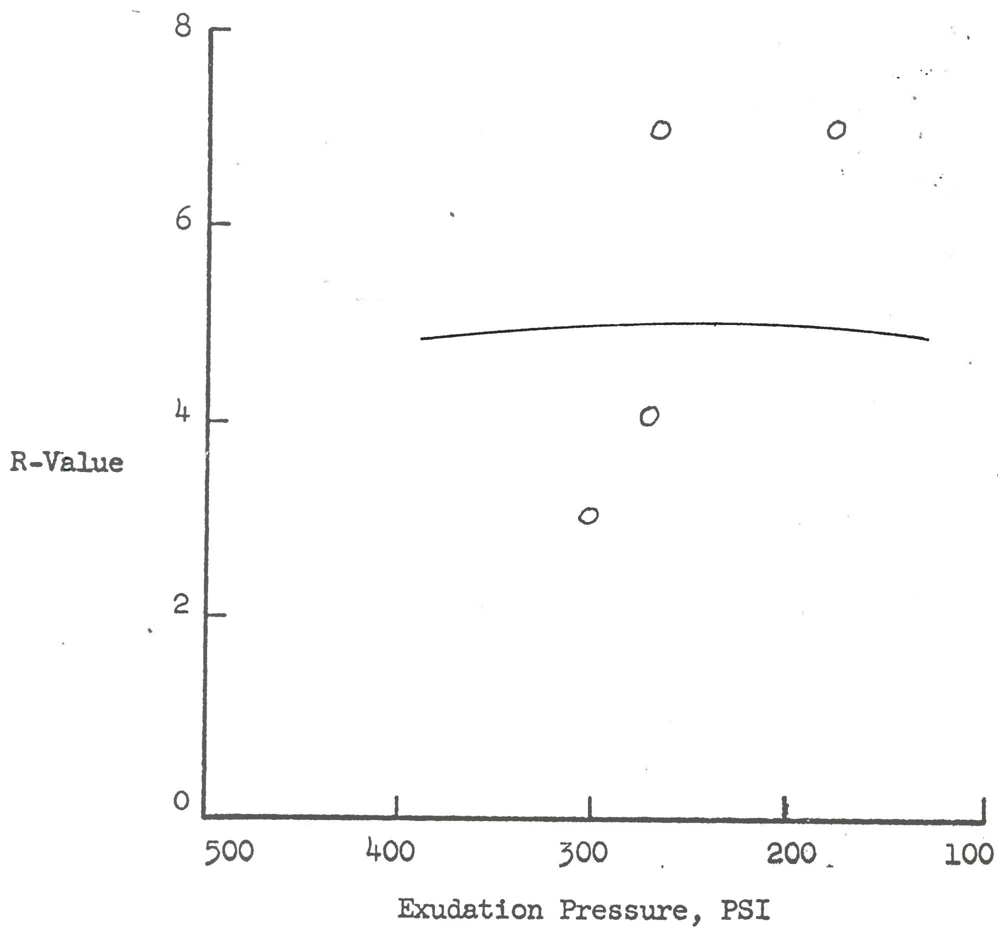
R-Value at 240 PSI: 71
R-Value at 300 PSI: 72



Summary of Data
California R-Value

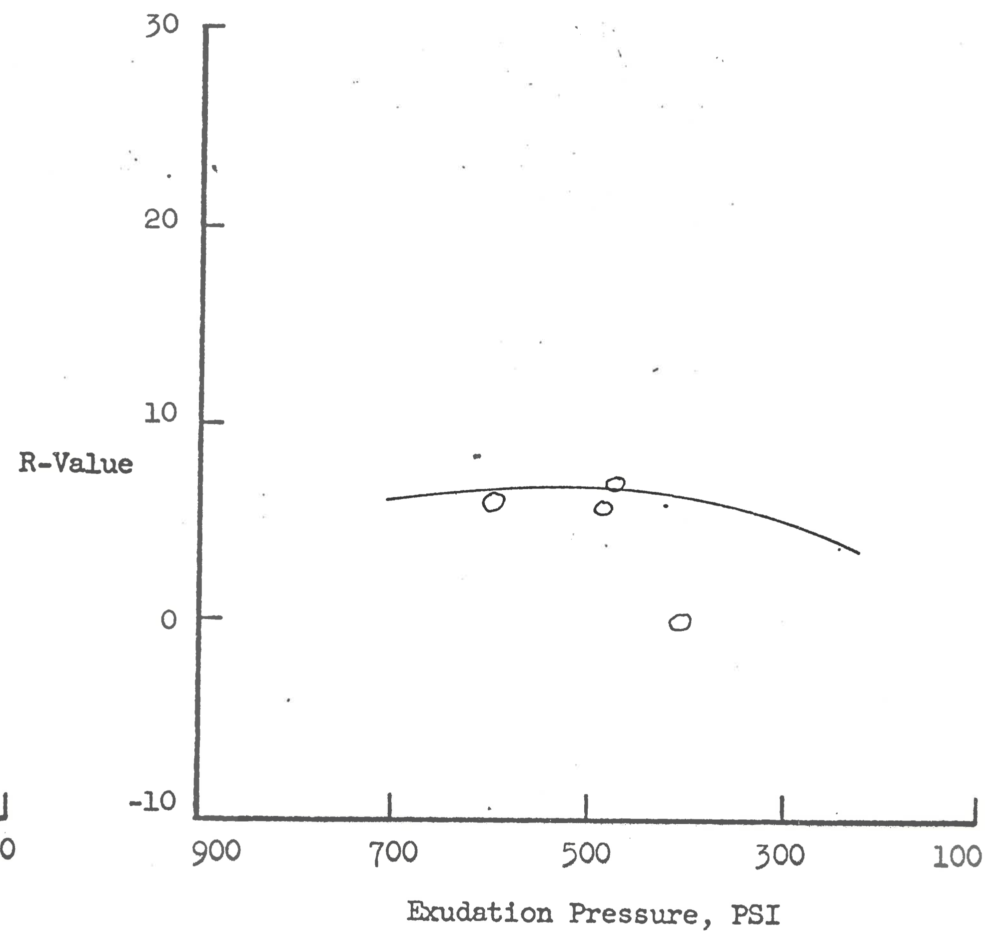
Sample No.: 162
Date Tested: 1-13-65
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 05
R-Value at 300 PSI: 05



Sample No.: 163
Date Tested: 2-8-66
Visual Description: Tan Clay

R-Value at 240 PSI: 04
R-Value at 300 PSI: 06



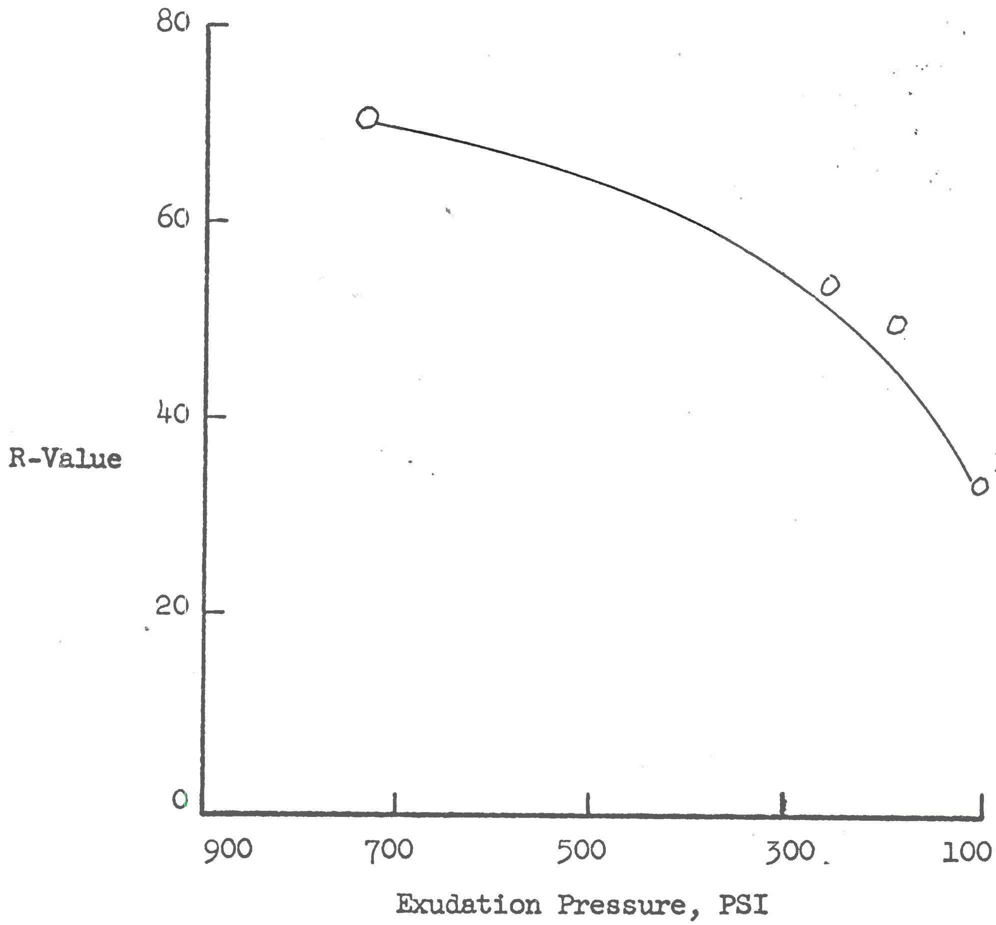
Summary of Data
California R-Value

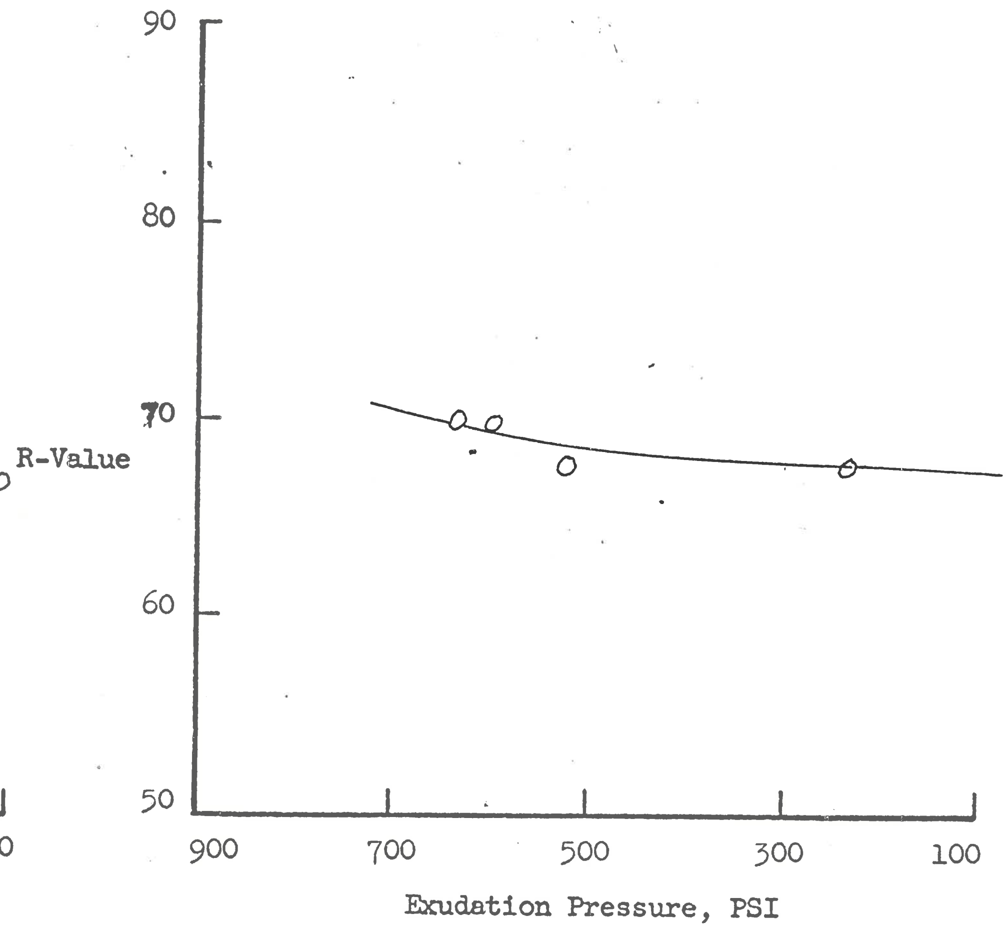
Sample No.: 164
Date Tested: 2-8-66
Visual Description: Tan Clay

R-Value at 240 PSI: 53
R-Value at 300 PSI: 55

Sample No.: 165
Date Tested: 2-6-66
Visual Description: Brown Sand

R-Value at 240 PSI: 68
R-Value at 300 PSI: 68

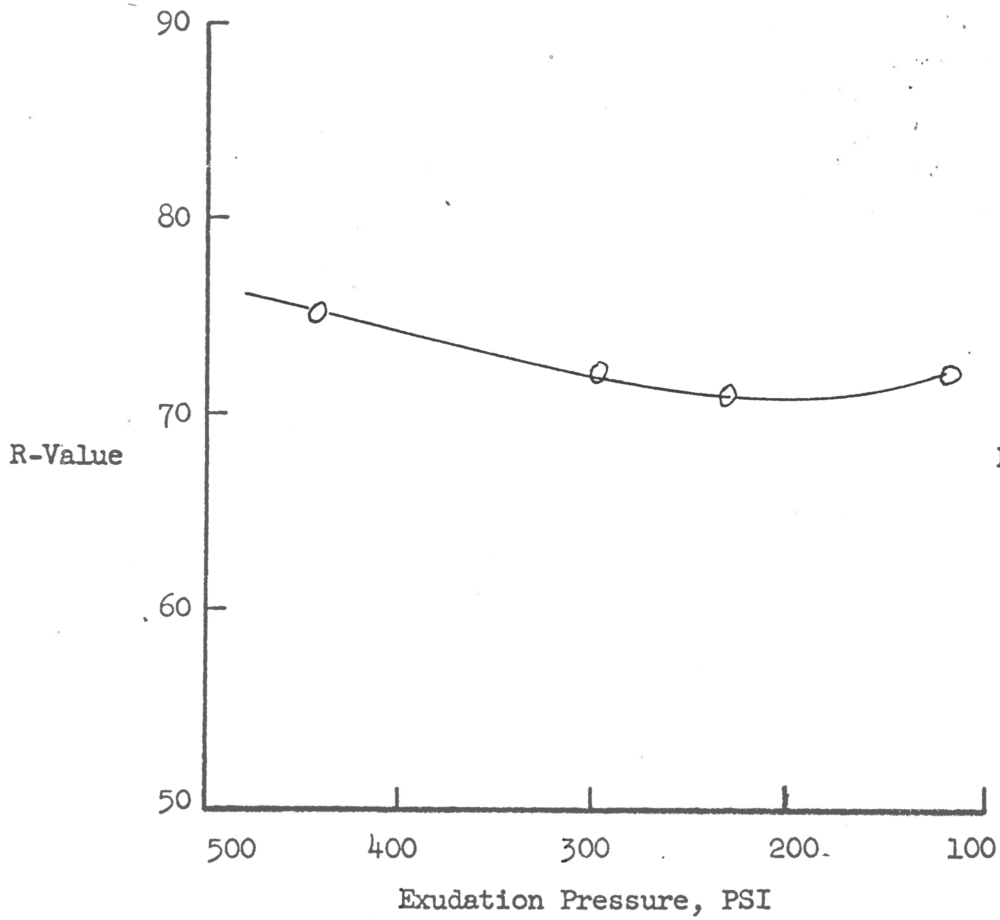




Summary of Data
California R-Value

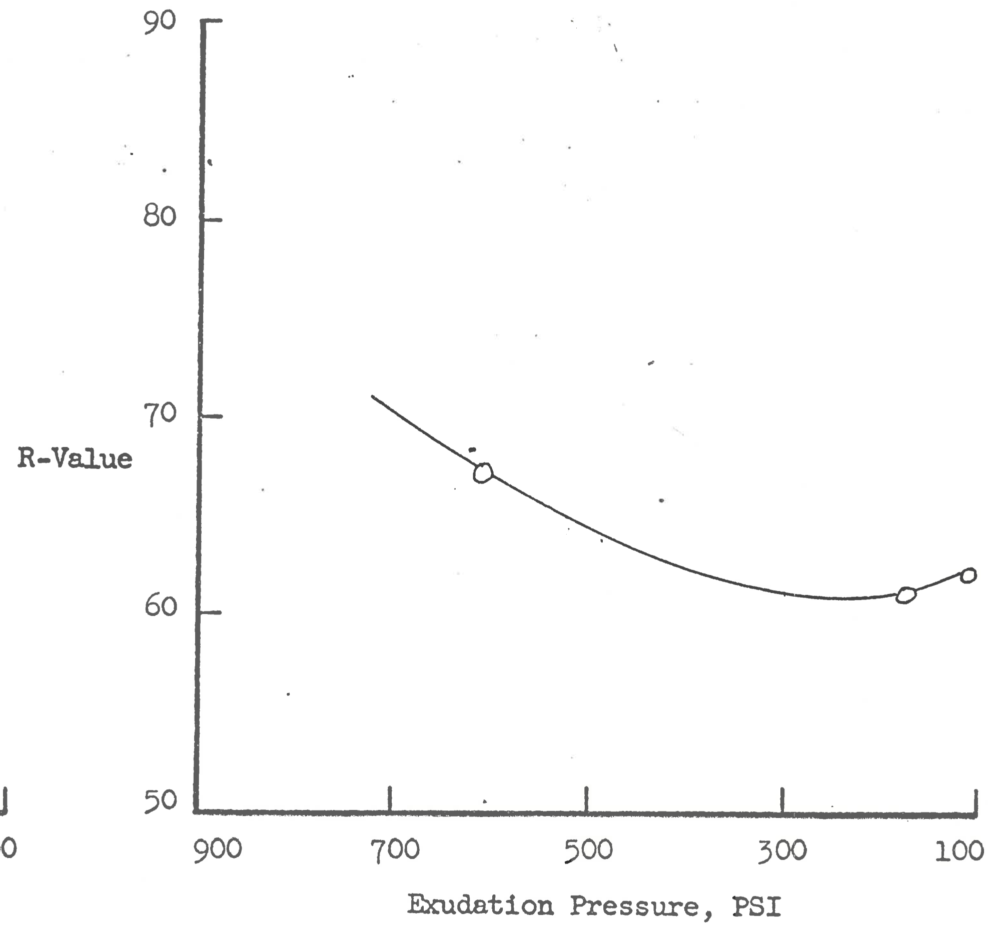
Sample No.: 167
Date Tested: 2-8-66
Visual Description: Tan Sand

R-Value at 240 PSI: 71
R-Value at 300 PSI: 72



Sample No.: 168
Date Tested: 2-8-66
Visual Description: Tan Sand

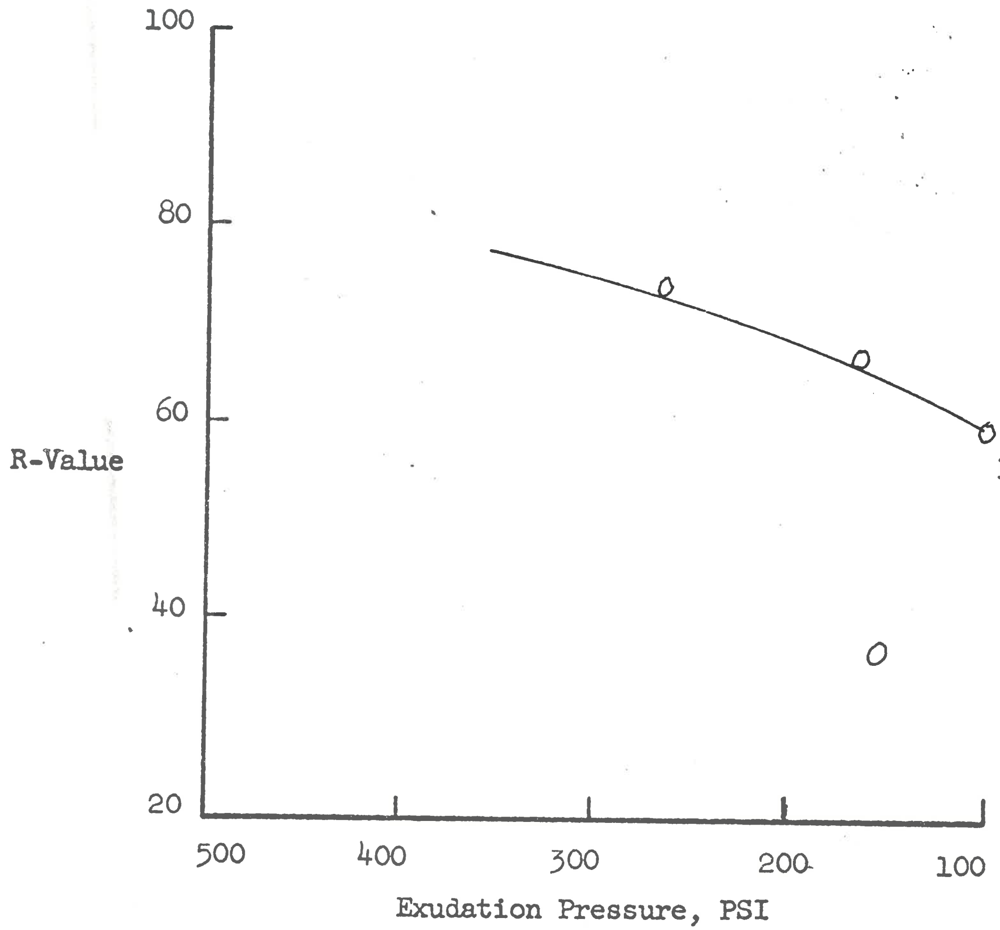
R-Value at 240 PSI: 61
R-Value at 300 PSI: 61



Summary of Data
California R-Value

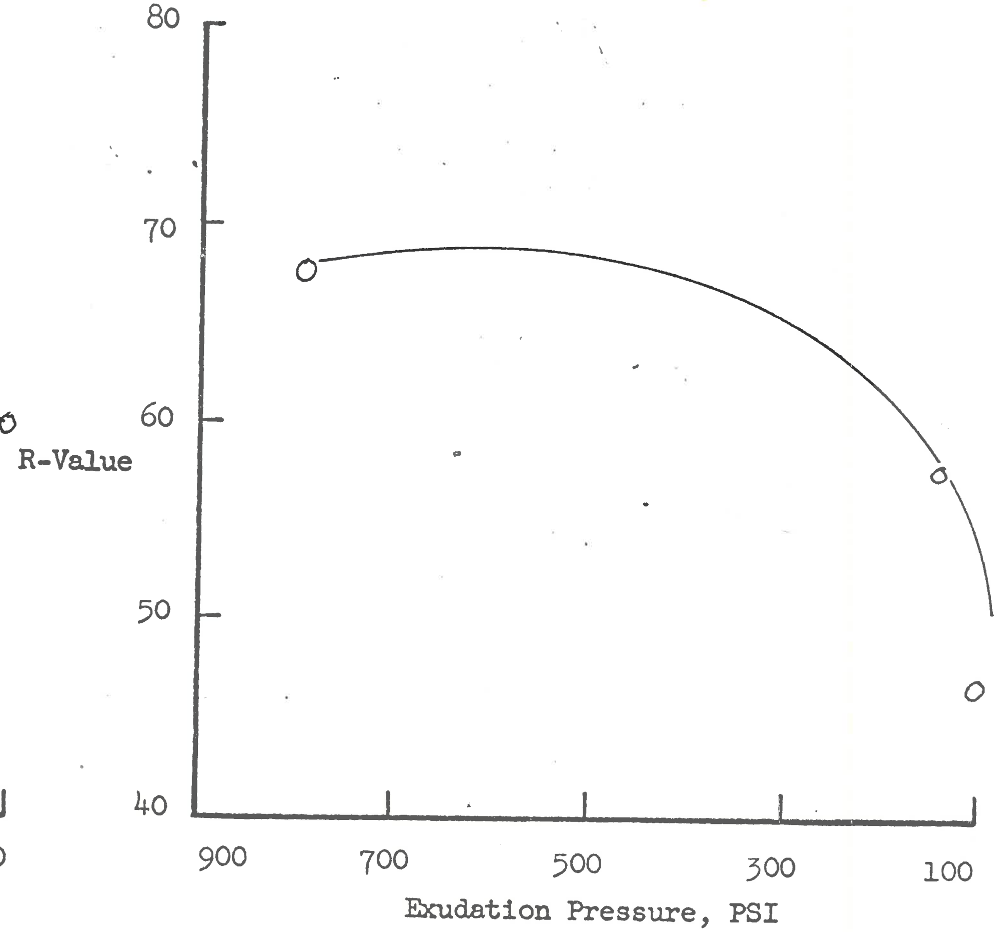
Sample No.: 170
Date Tested: 3-8-66
Visual Description: Red Sand

R-Value at 240 PSI: 73
R-Value at 300 PSI: 75



Sample No.: 171
Date Tested: 2-8-66
Visual Description: Red Sand

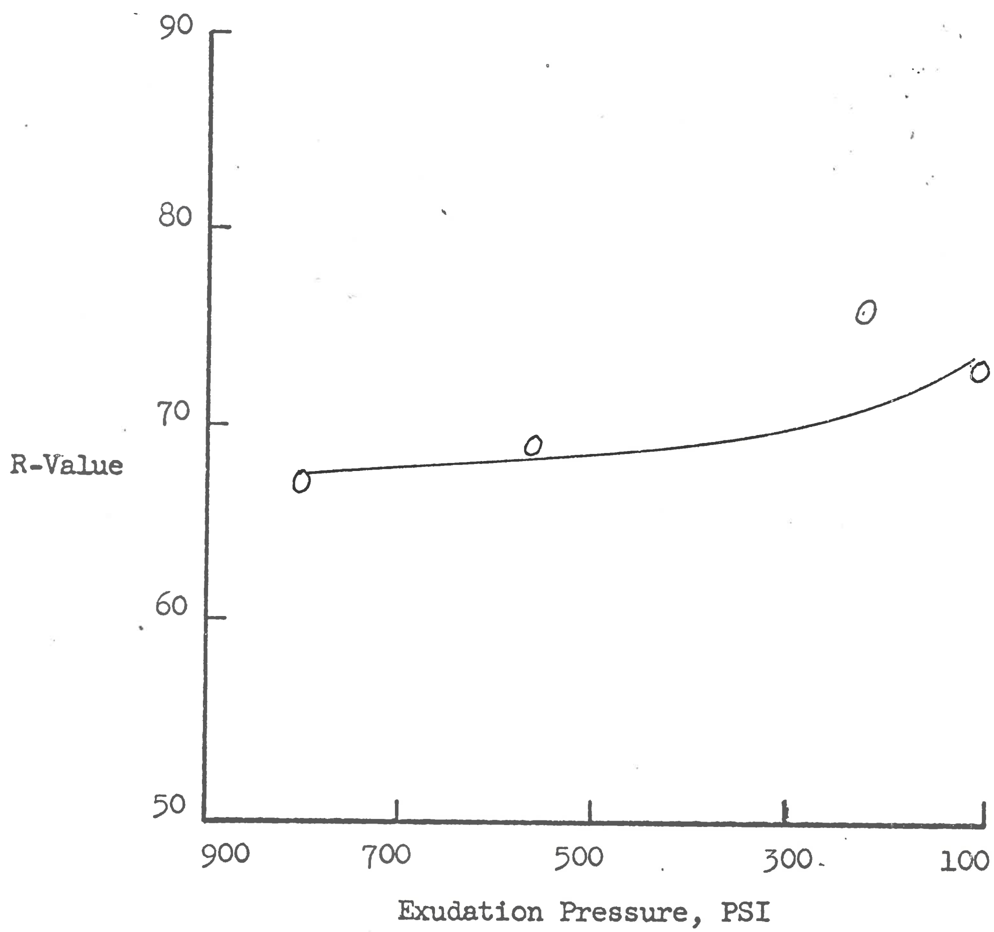
R-Value at 240 PSI: 66
R-Value at 300 PSI: 68



Summary of Data
California R-Value

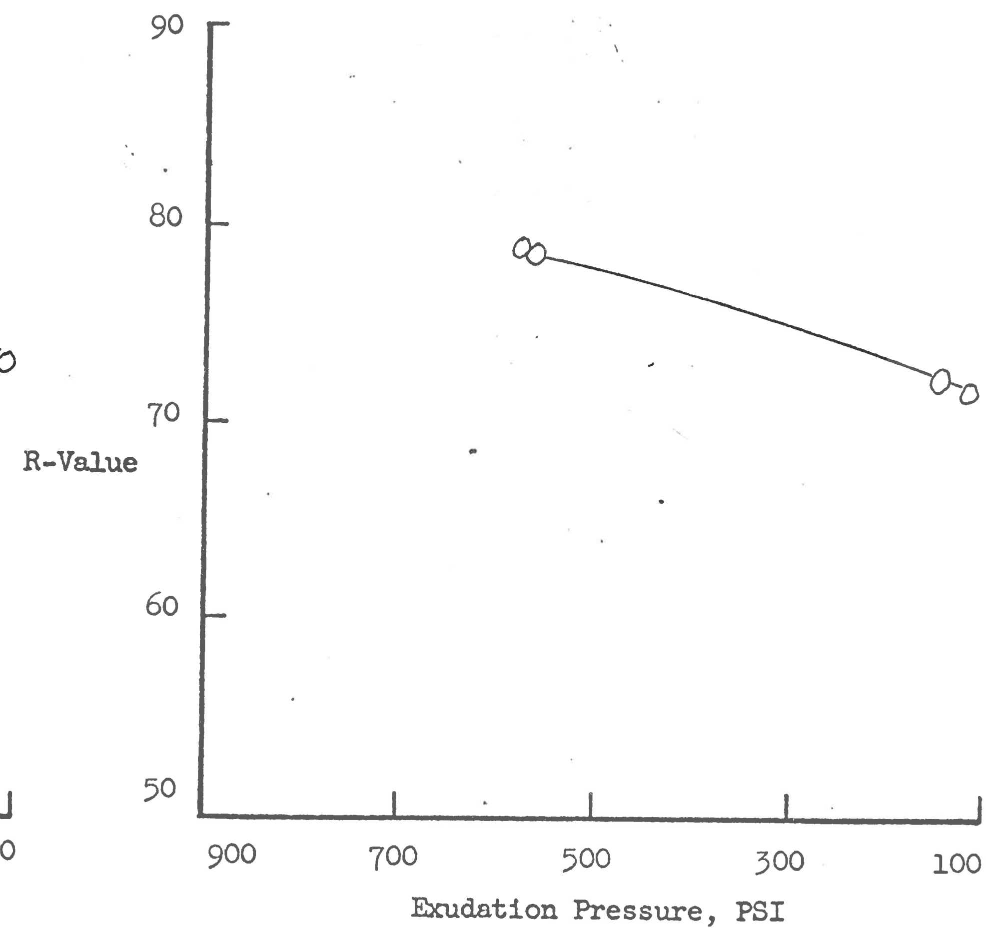
Sample No.: 174
Date Tested: 2-8-66
Visual Description: Donnafill

R-Value at 240 PSI: 71
R-Value at 300 PSI: 70



Sample No.: 175
Date Tested: 11-17-65
Visual Description: Donnafill

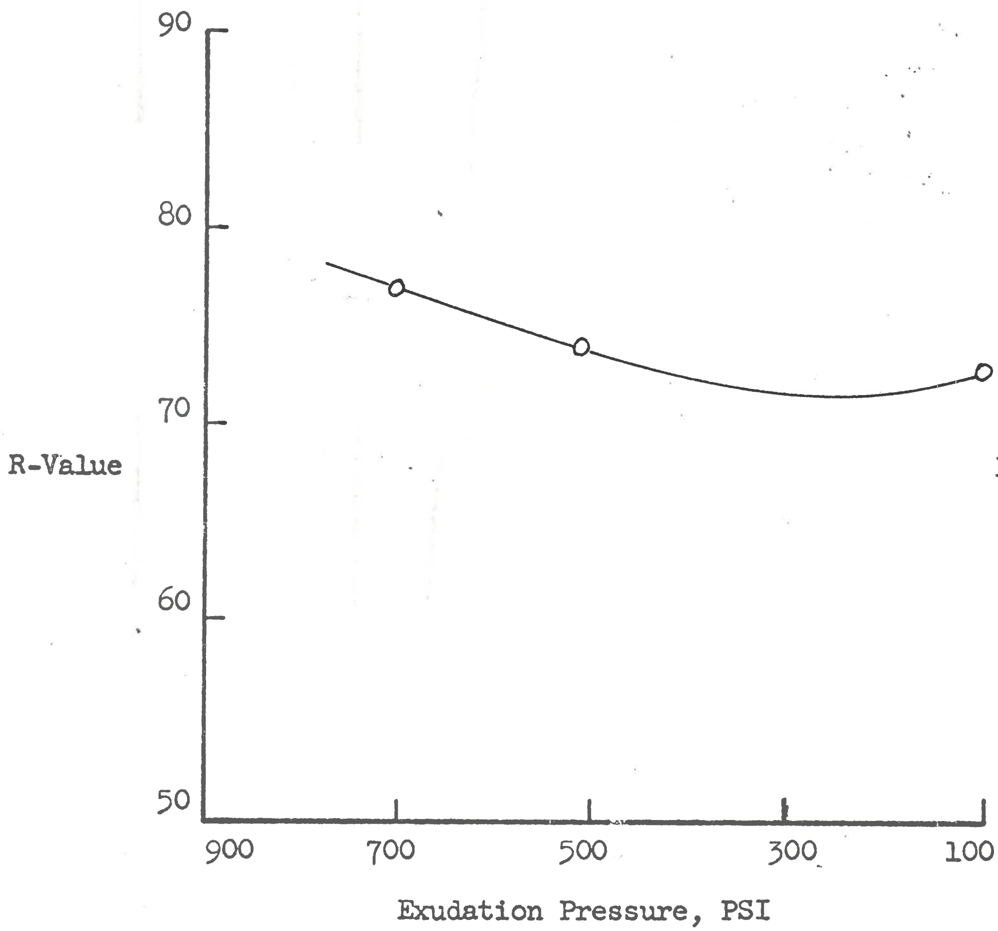
R-Value at 240 PSI: 75
R-Value at 300 PSI: 76



Summary of Data
California R-Value

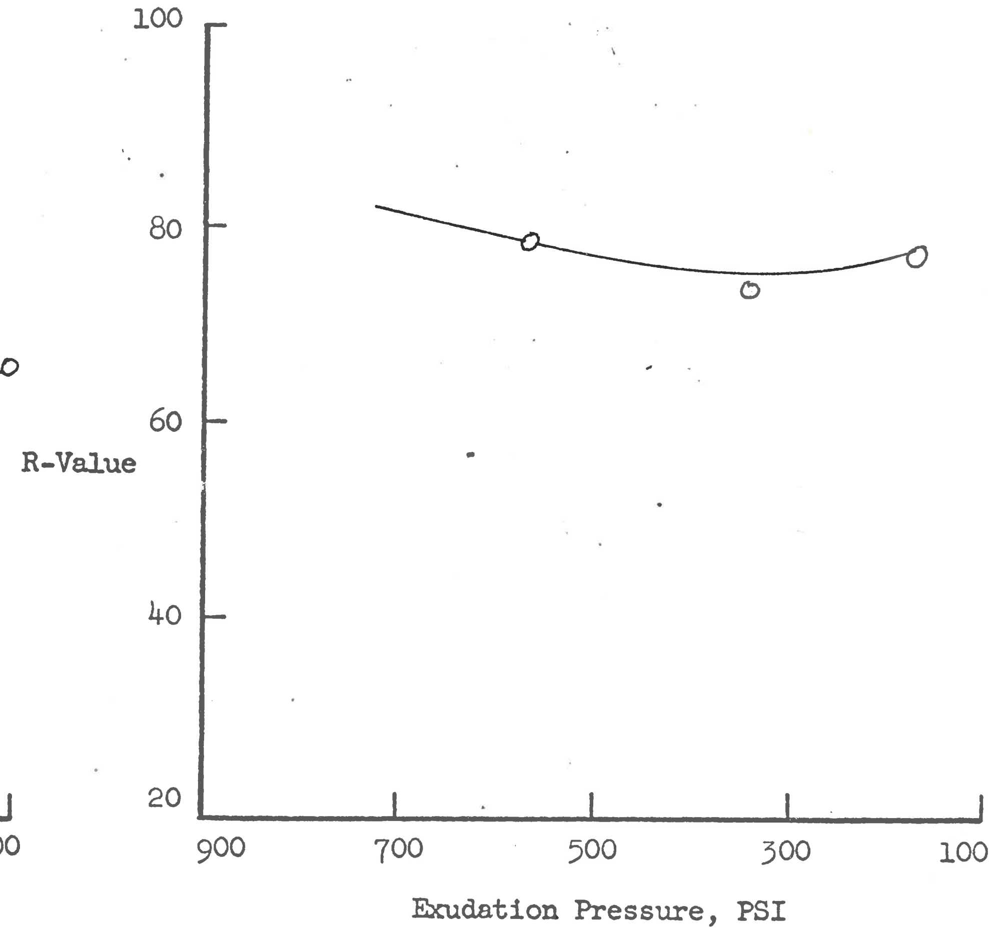
Sample No.: 176
Date Tested: 2-6-66
Visual Description: Donnafill

R-Value at 240 PSI: 72
R-Value at 300 PSI: 72



Sample No.: 200
Date Tested: 4-21-67
Visual Description: Tan Sandy Clay with Gravel

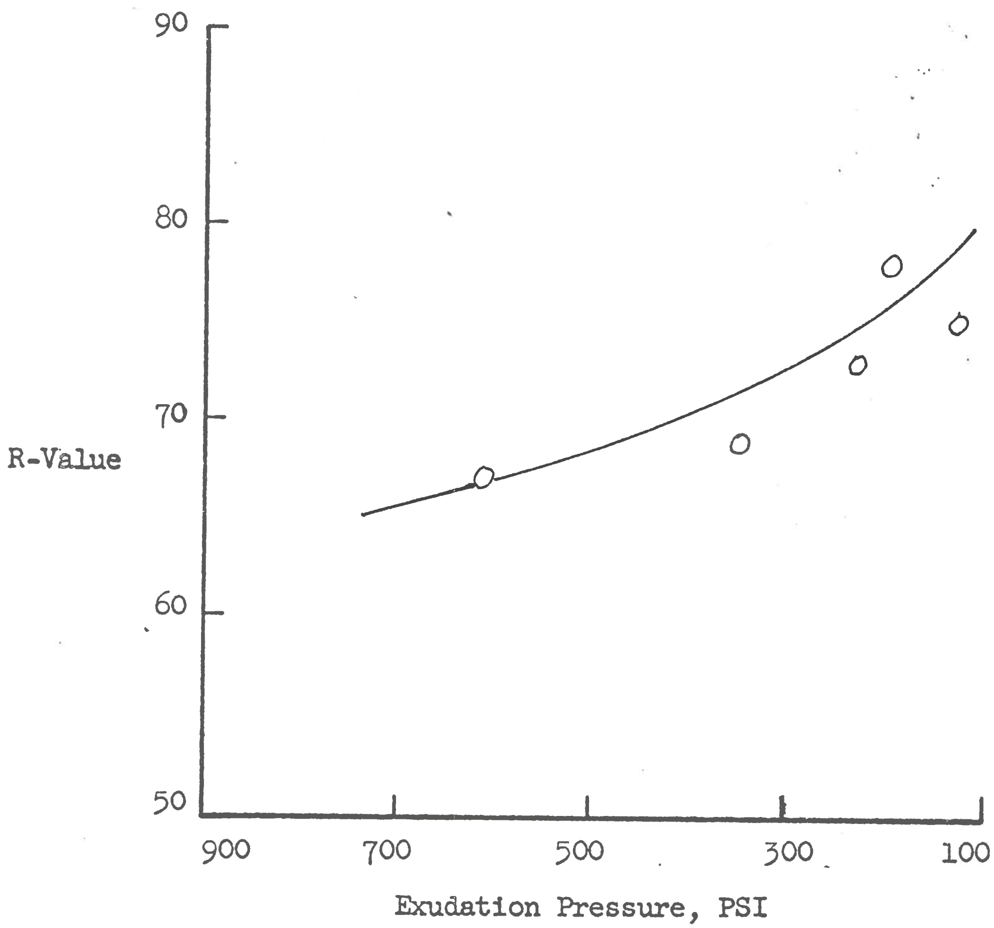
R-Value at 240 PSI: 77
R-Value at 300 PSI: 77



Summary of Data
California R-Value

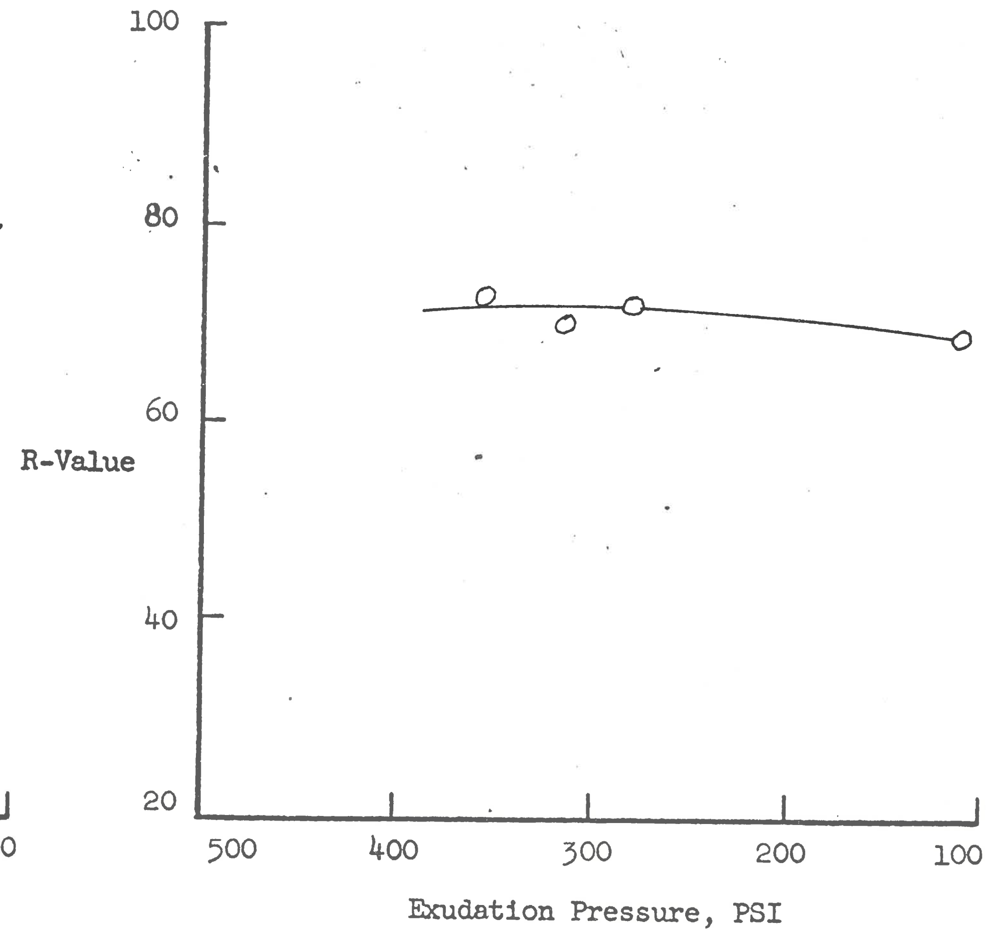
Sample No.: 201
Date Tested: 4-26-67
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 74
R-Value at 300 PSI: 73



Sample No.: 202
Date Tested: 4-26-67
Visual Description: Tan Sandy Clay

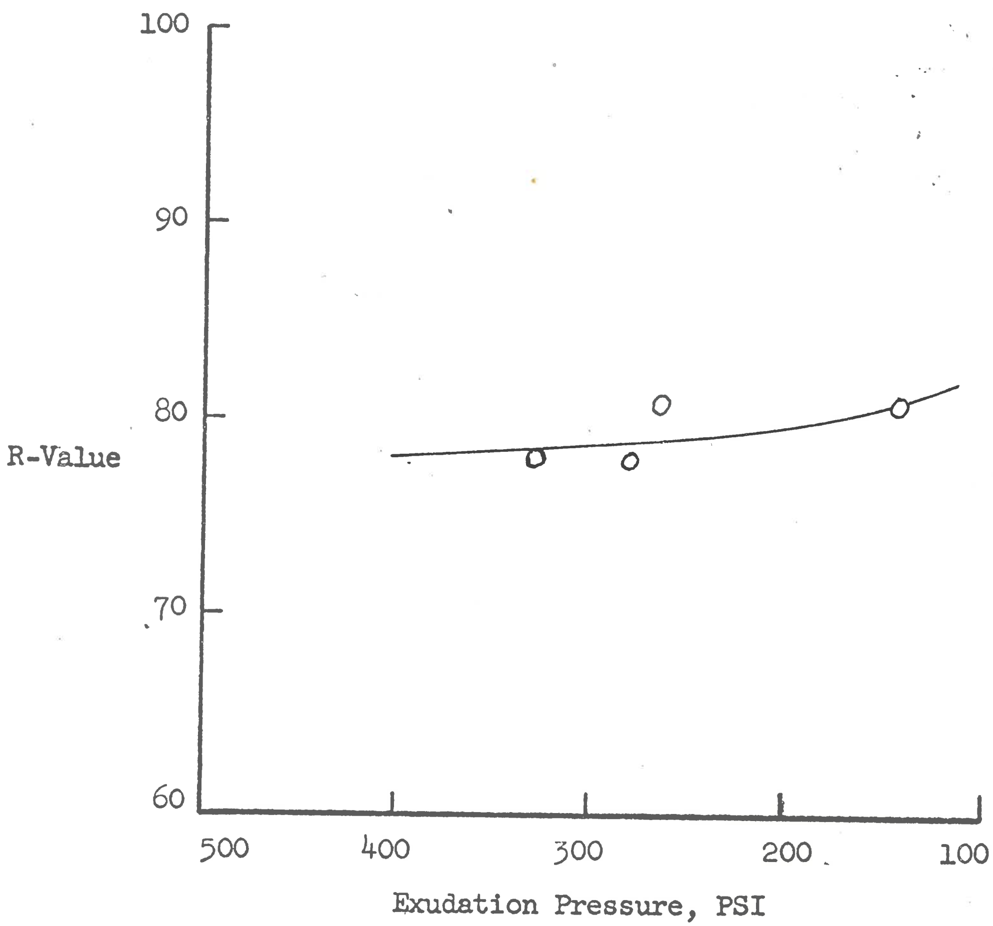
R-Value at 240 PSI: 71
R-Value at 300 PSI: 72



Summary of Data
California R-Value

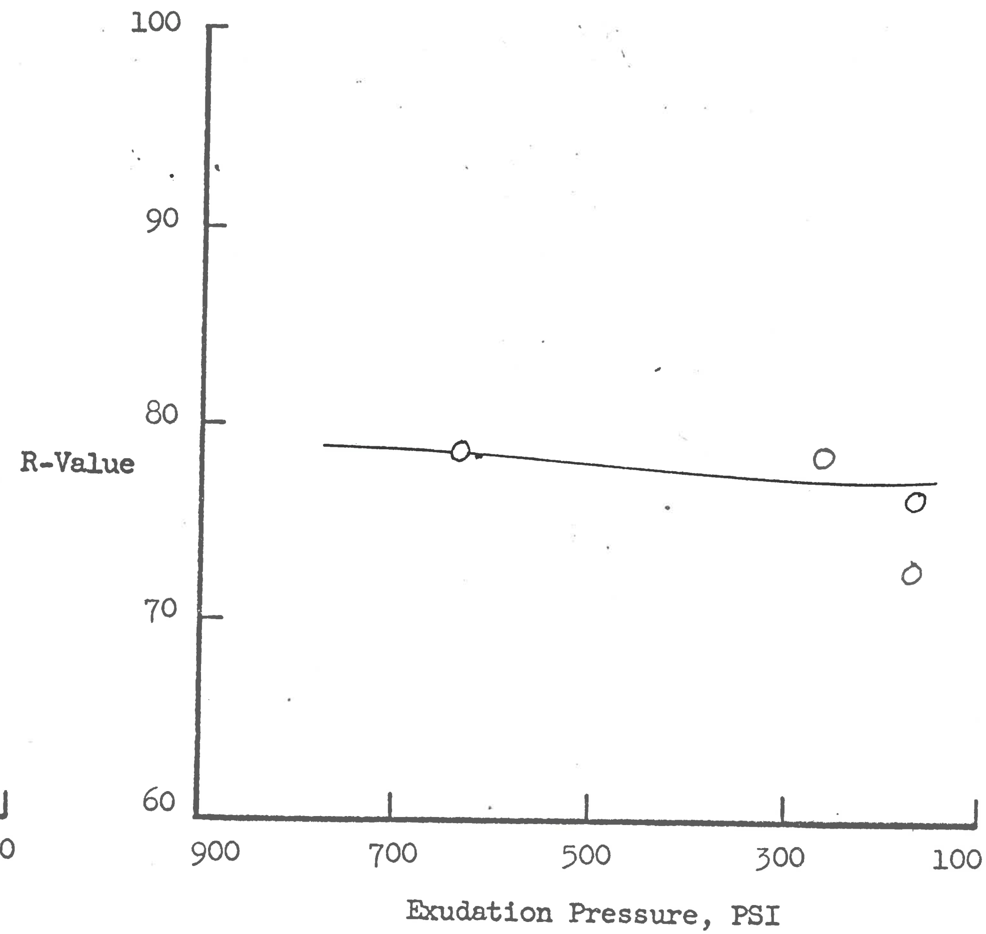
Sample No.: 203
Date Tested: 4-26-67
Visual Description: Sandy Clay with Gravel

R-Value at 240 PSI: 79
R-Value at 300 PSI: 79



Sample No.: 204
Date Tested: 4-26-67
Visual Description: Tan Sandy Clay

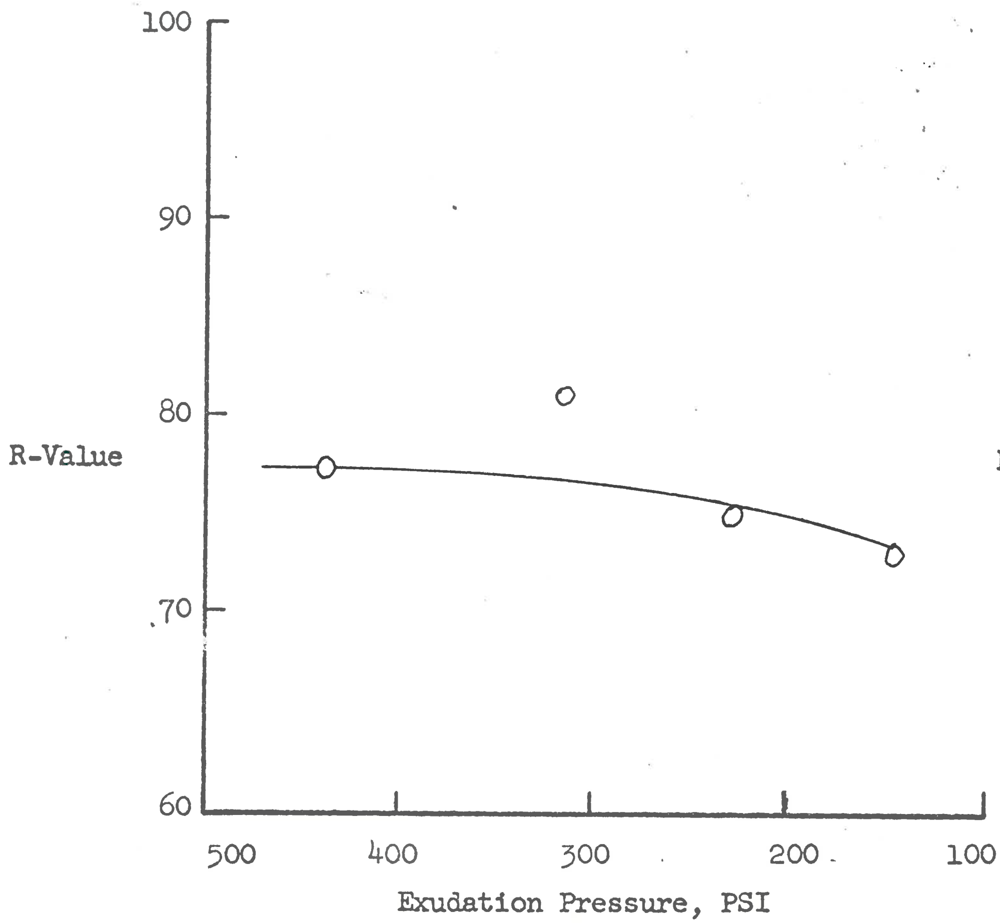
R-Value at 240 PSI: 78
R-Value at 300 PSI: 78



Summary of Data
California R-Value

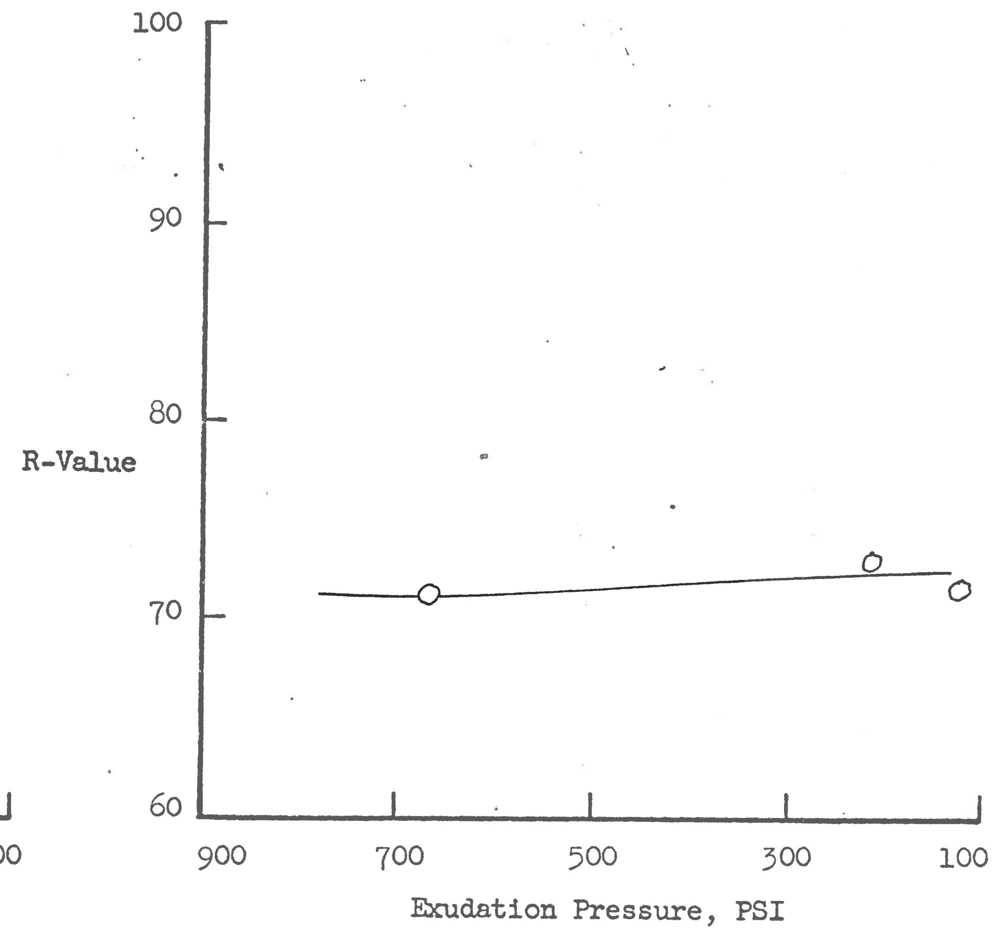
Sample No.: 205
Date Tested: 4-26-67
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 76
R-Value at 300 PSI: 76



Sample No.: 206
Date Tested: 4-26-67
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 72
R-Value at 300 PSI: 72



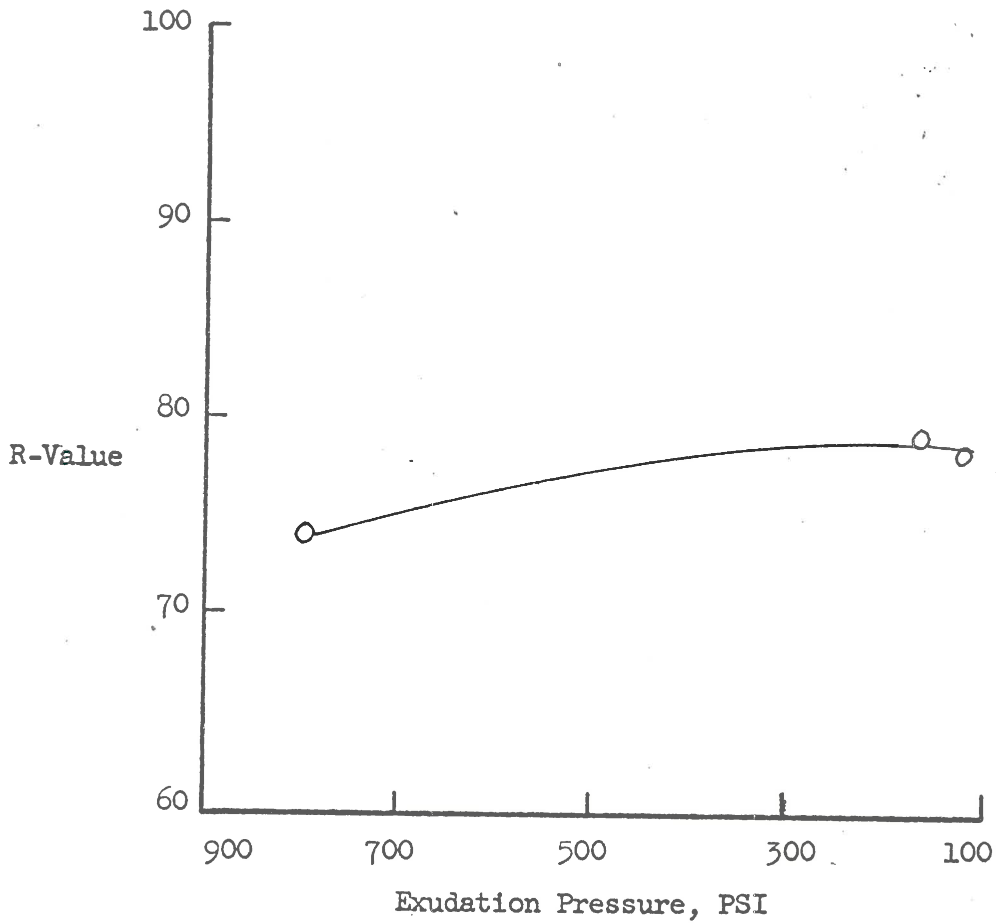
Summary of Data
California R-Value

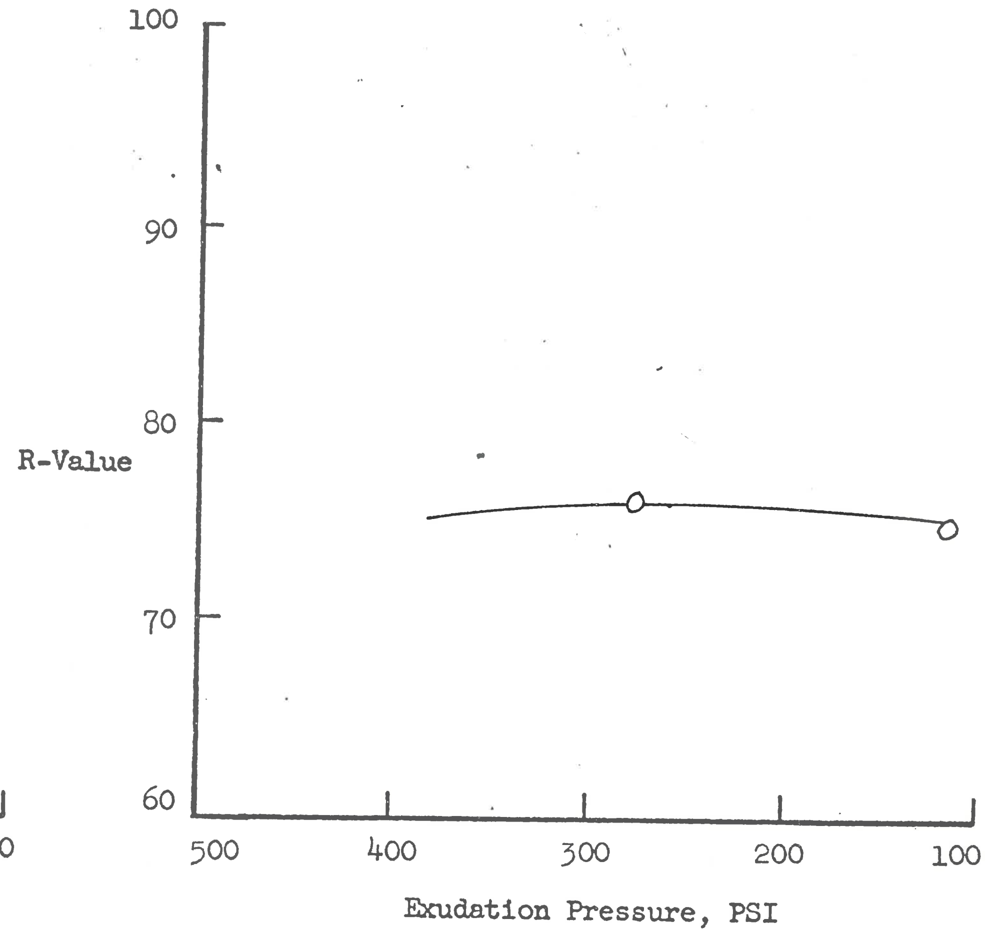
Sample No.: 207
Date Tested: 4-26-67
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 78
R-Value at 300 PSI: 78

Sample No.: 208
Date Tested: 4-26-67
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 76
R-Value at 300 PSI: 76





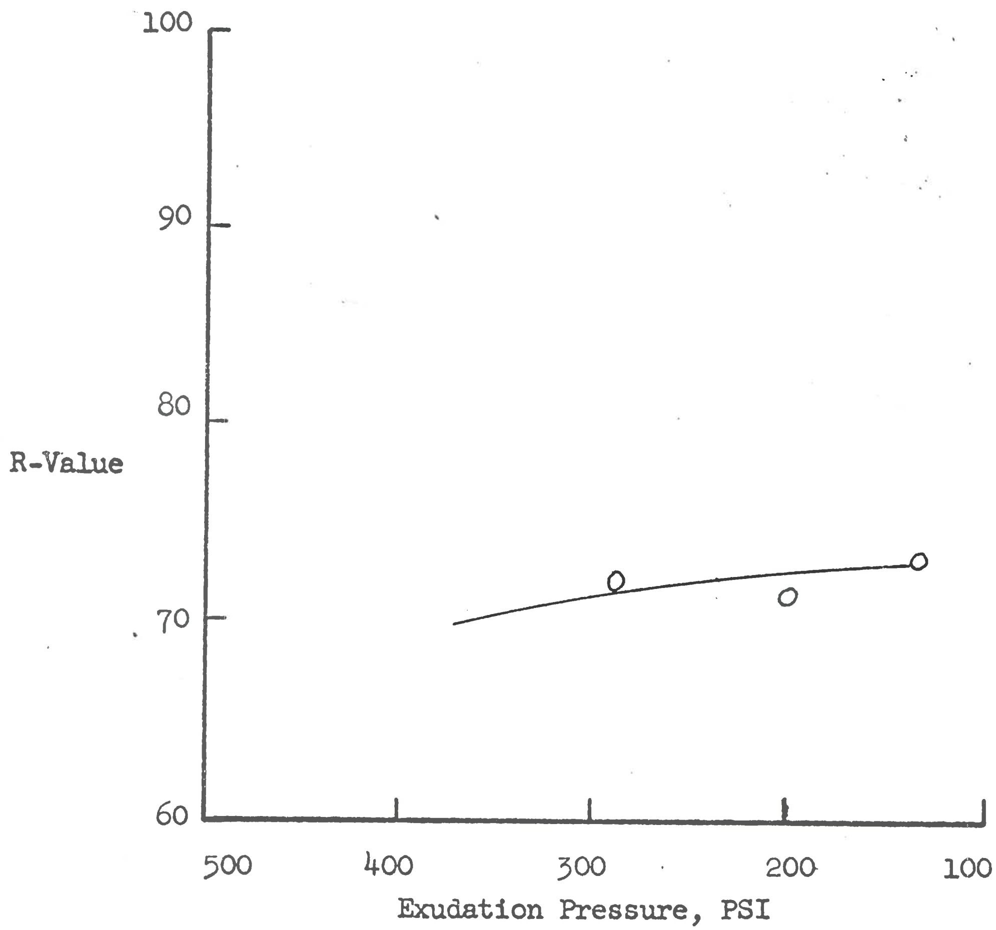
Summary of Data
California R-Value

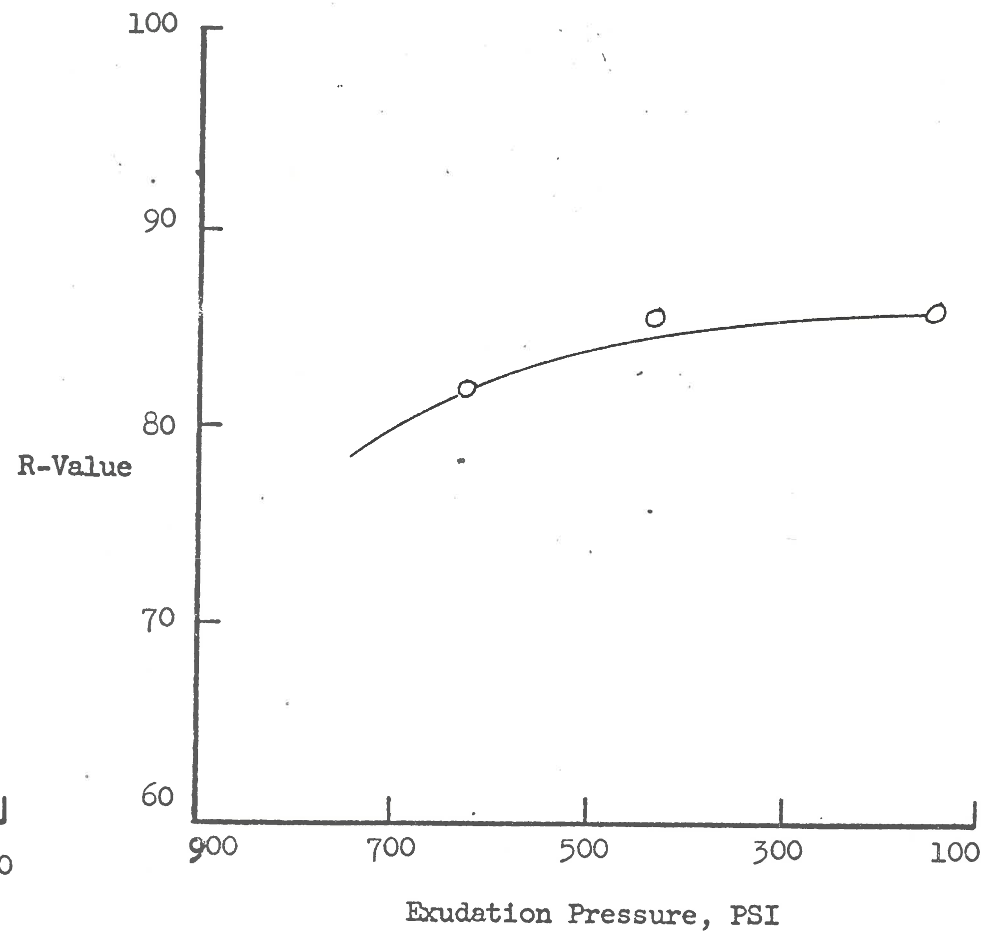
Sample No.: 209
Date Tested: 4-21-67
Visual Description: Sandy Clay with Gravel

R-Value at 240 PSI: 72
R-Value at 300 PSI: 71

Sample No.: 211
Date Tested: 4-26-67
Visual Description: Gray Sand

R-Value at 240 PSI: 86
R-Value at 300 PSI: 86

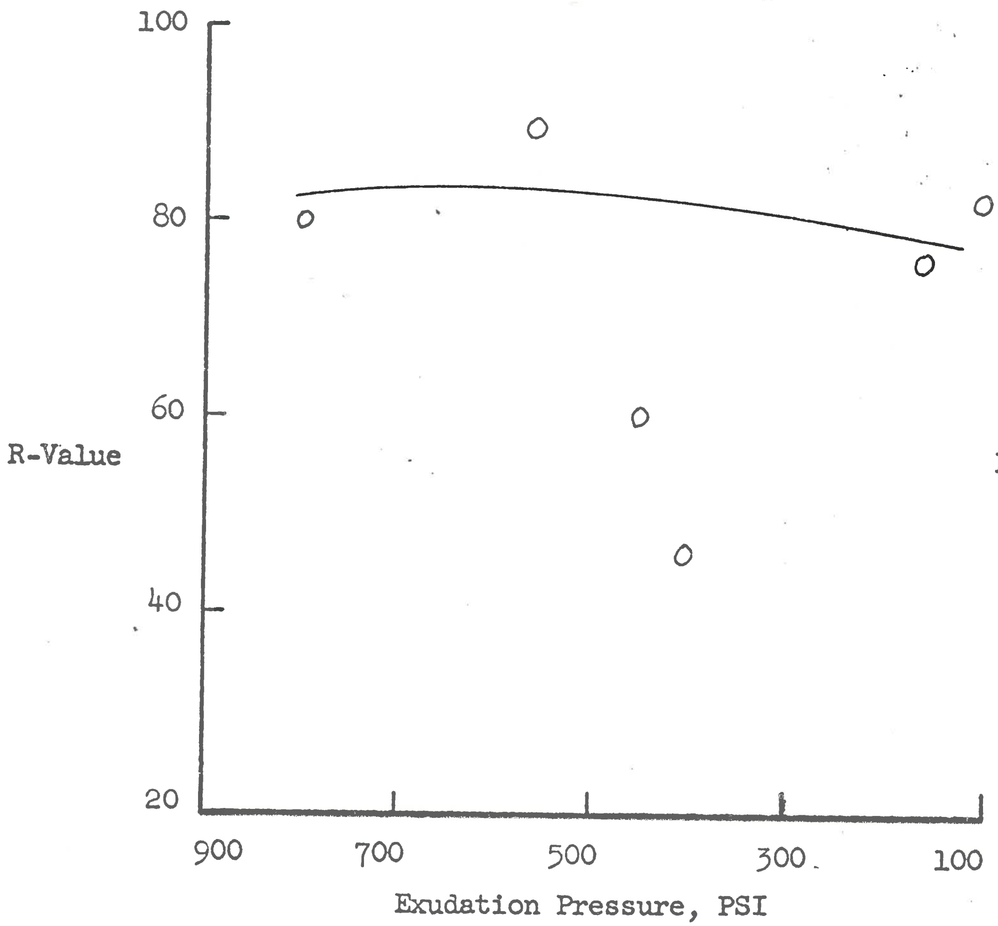




Summary of Data
California R-Value

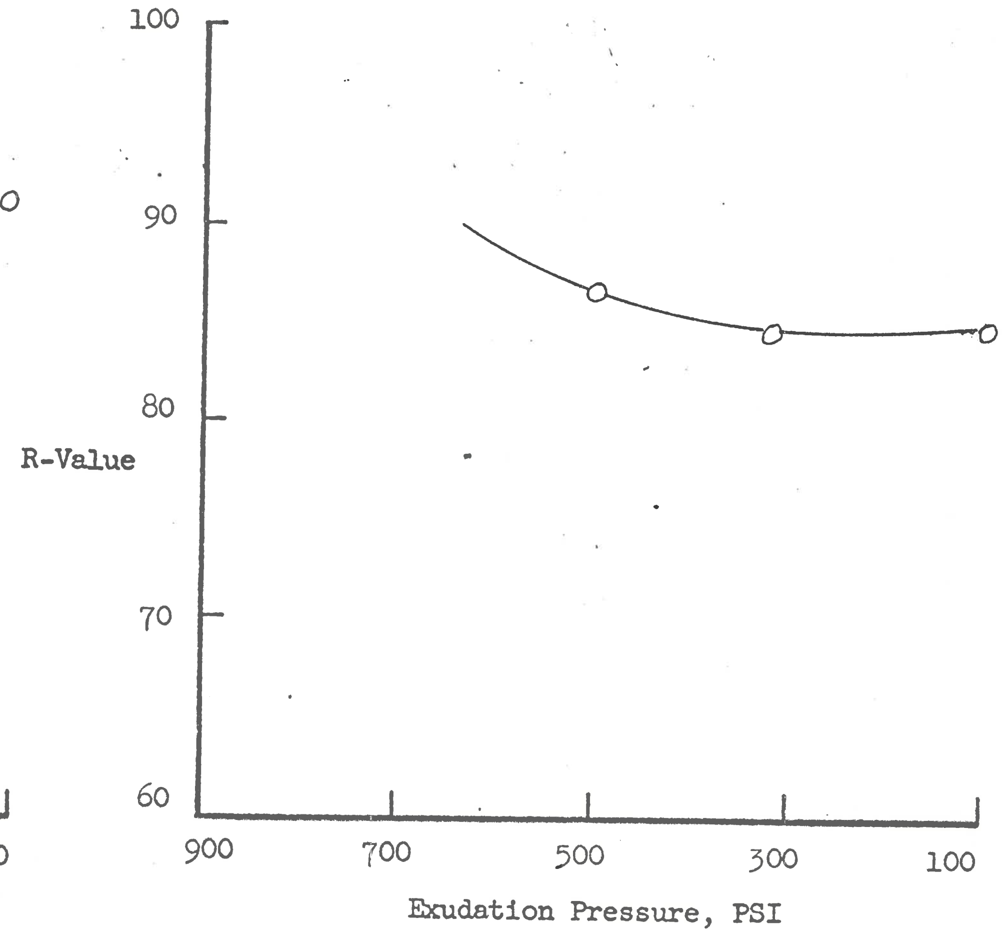
Sample No.: 212
Date Tested: 4-26-67
Visual Description: Yellow Clayey Sand

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



Sample No.: 213
Date Tested: 4-26-67
Visual Description: Yellow Clayey Sand

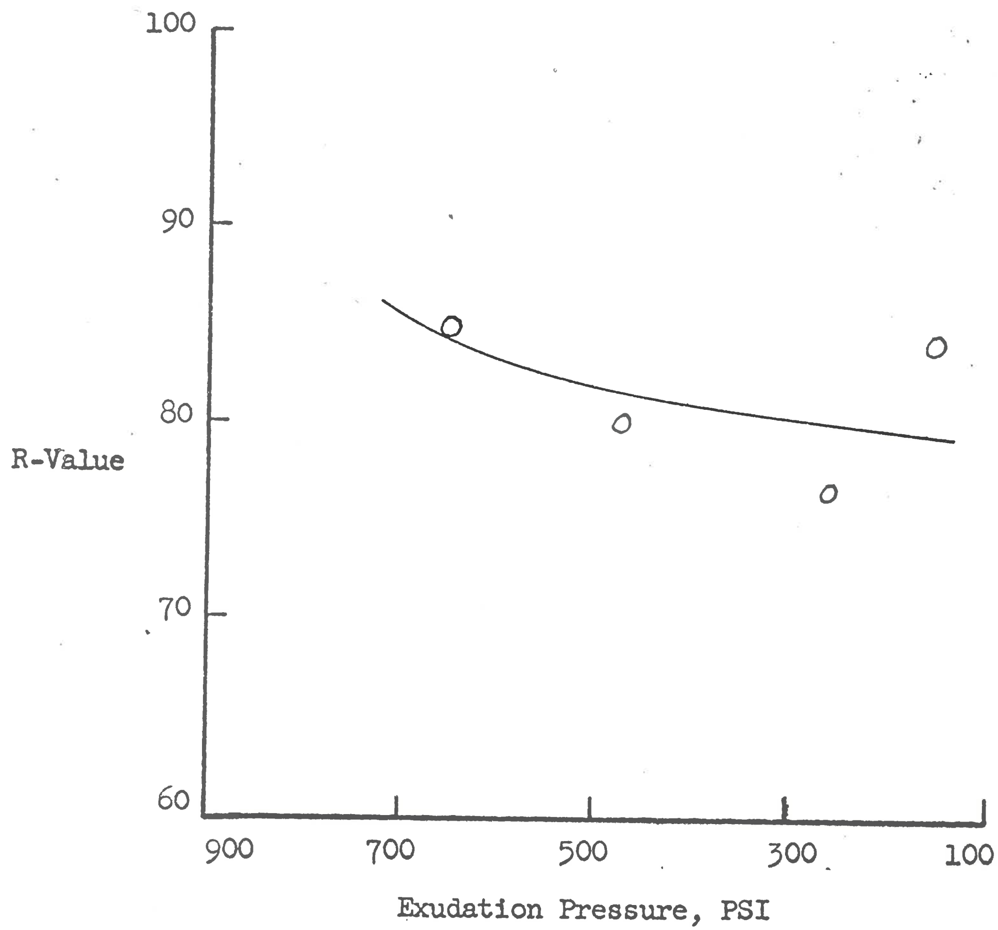
R-Value at 240 PSI: 85
R-Value at 300 PSI: 85



Summary of Data
California R-Value

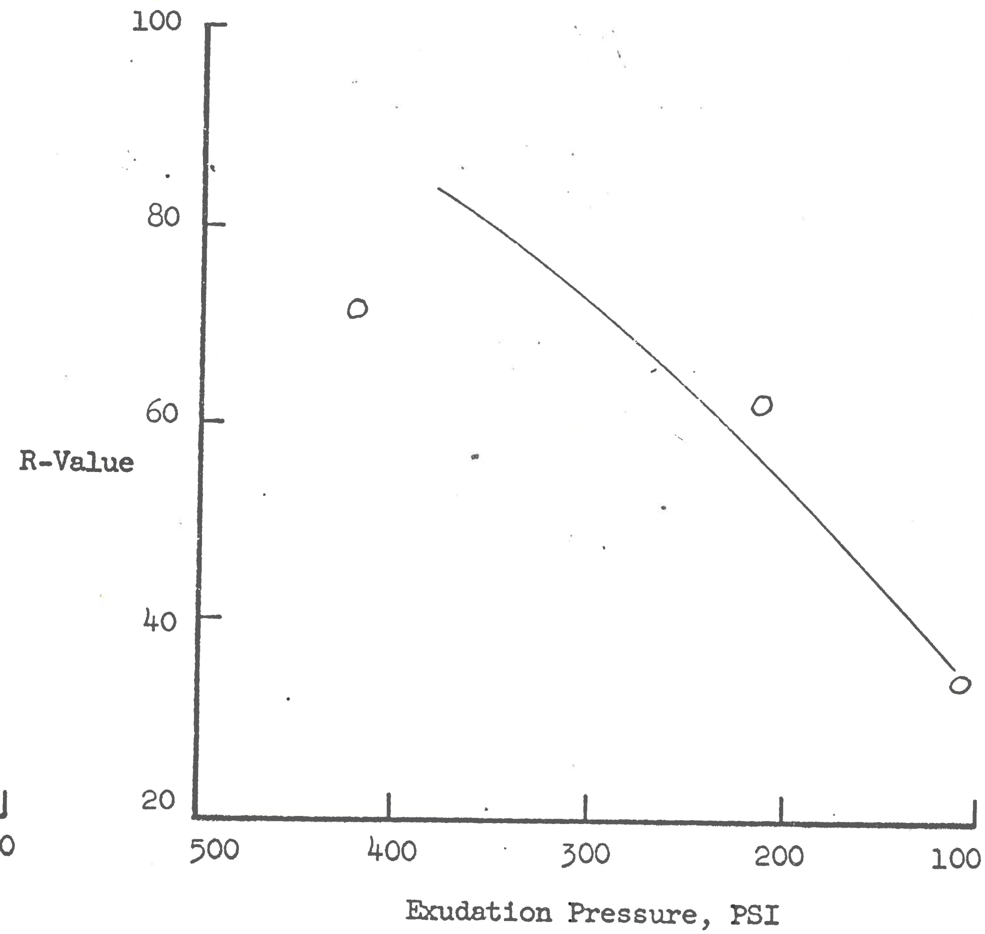
Sample No.: 214
Date Tested: 4-26-67
Visual Description: Yellow Clayey Sand

R-Value at 240 PSI: 80
R-Value at 300 PSI: 81



Sample No.: 215
Date Tested: 4-22-67
Visual Description: Yellow Sandy Clay

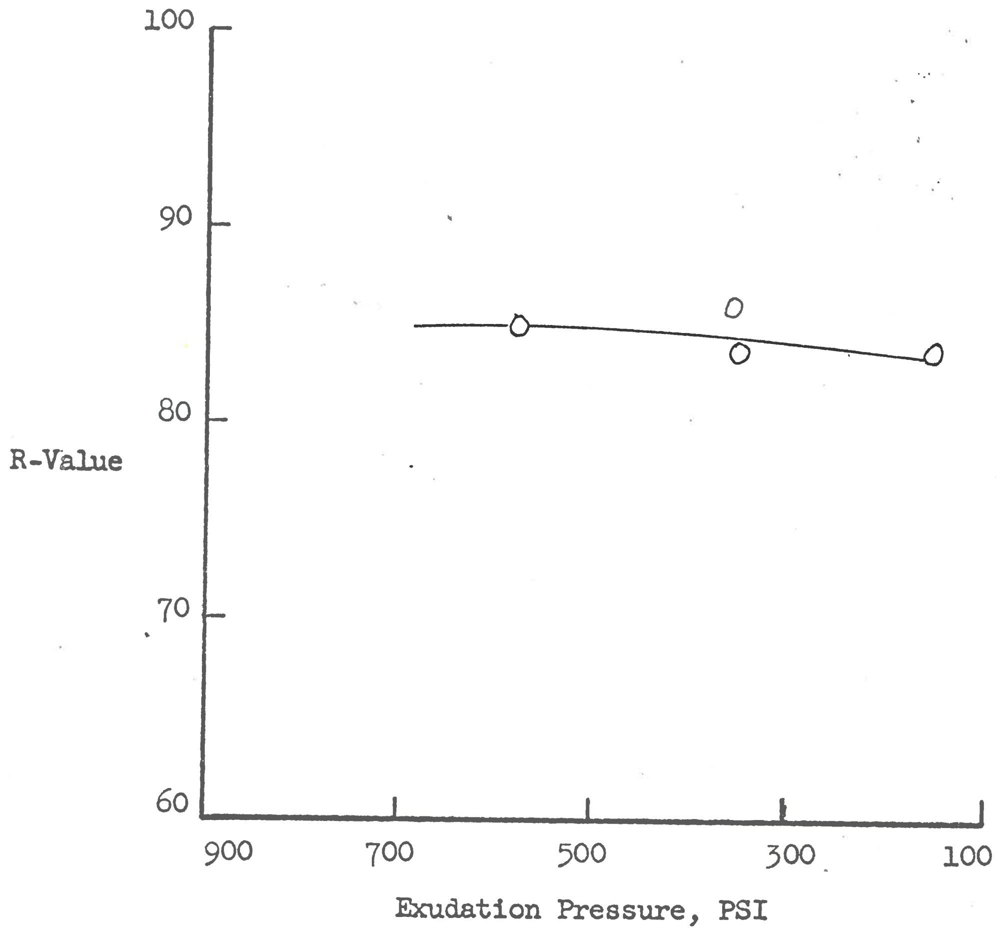
R-Value at 240 PSI: 62
R-Value at 300 PSI: 67



Summary of Data
California R-Value

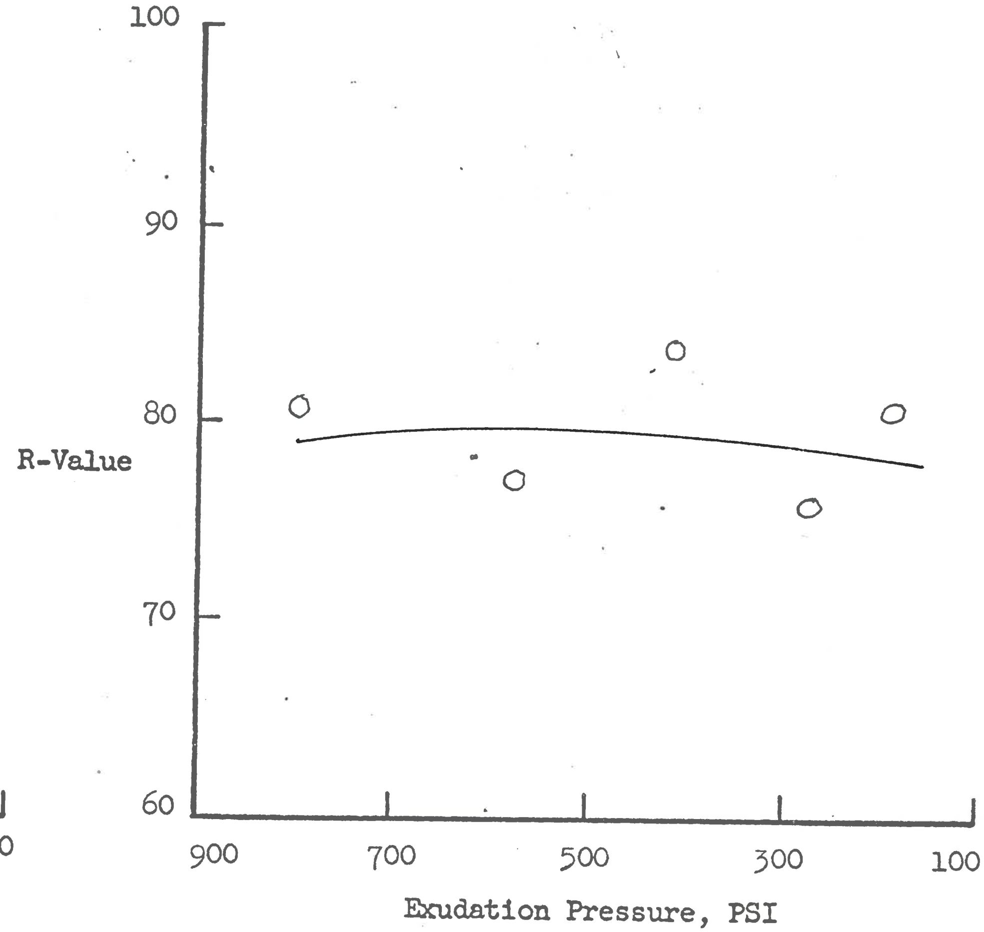
Sample No.: 216
Date Tested: 4-26-67
Visual Description: Yellow Clayey Sand

R-Value at 240 PSI: 84
R-Value at 300 PSI: 84



Sample No.: 217
Date Tested: 4-26-67
Visual Description: Gray Sandy Silt

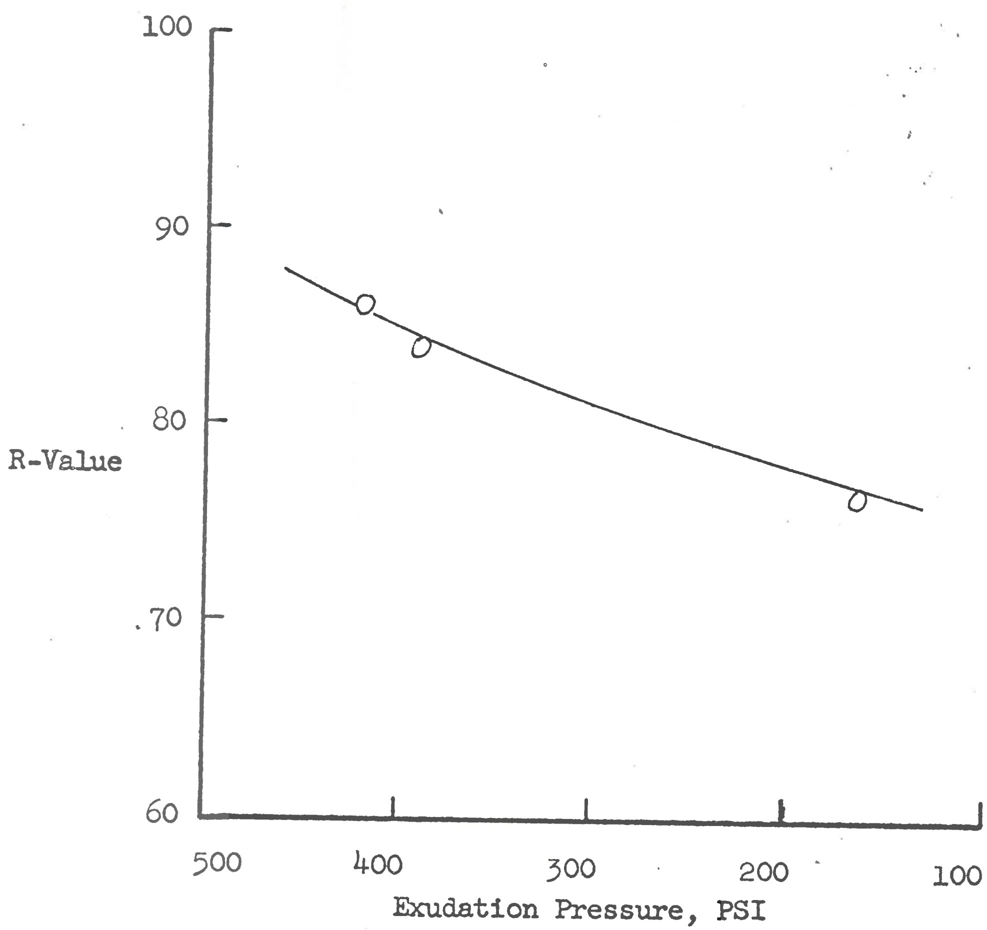
R-Value at 240 PSI: 79
R-Value at 300 PSI: 79



Summary of Data
California R-Value

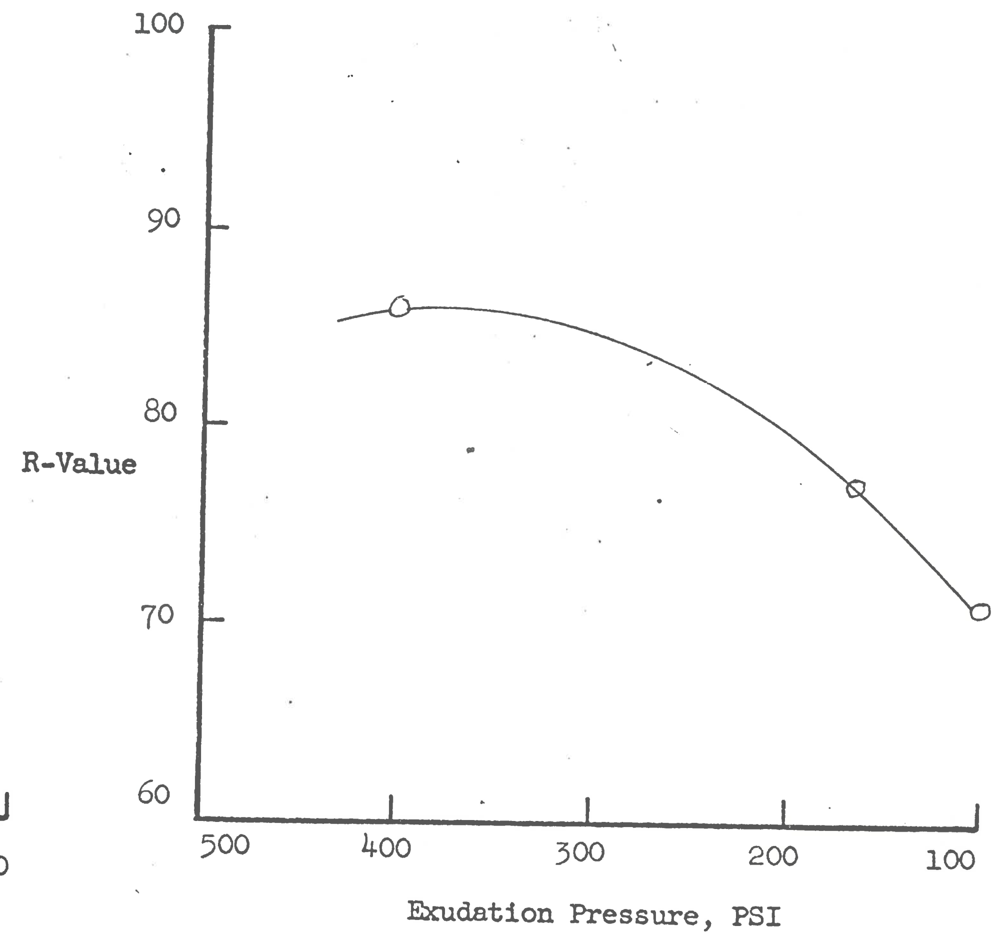
Sample No.: 218
Date Tested: 4-26-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 79
R-Value at 300 PSI: 81



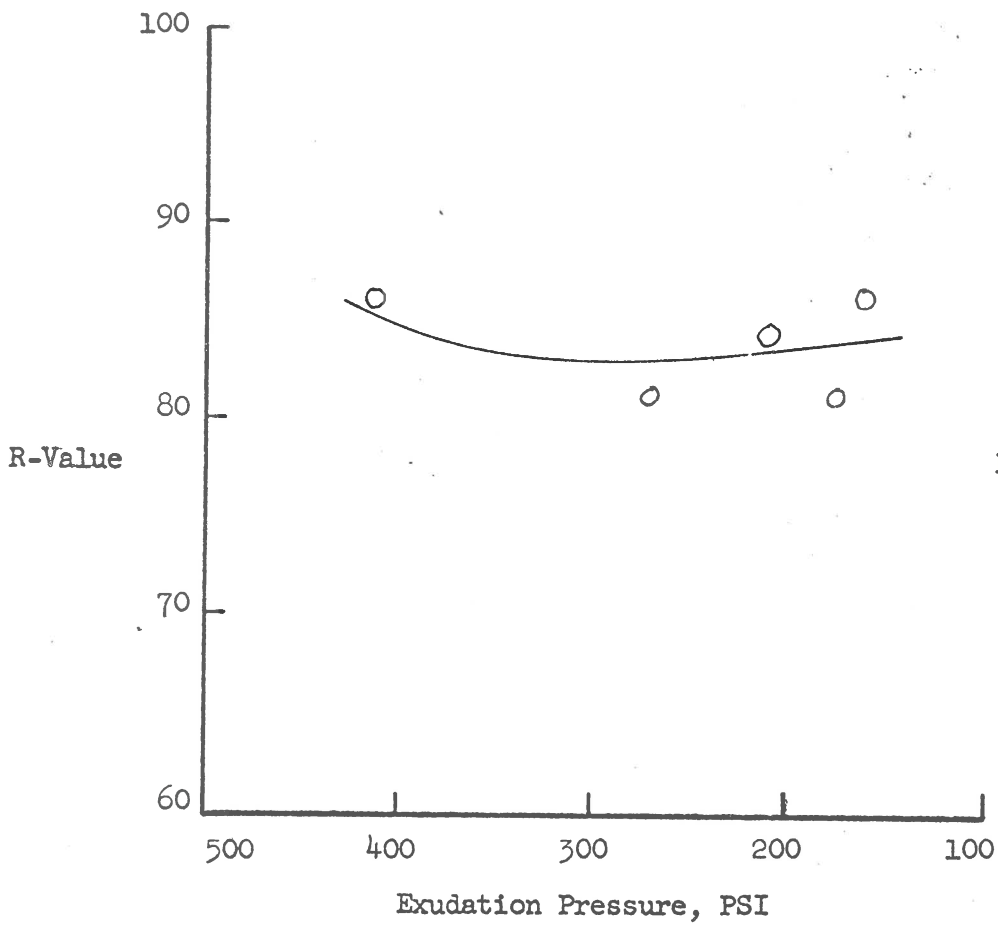
Sample No.: 219
Date Tested: 4-26-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 83
R-Value at 300 PSI: 85

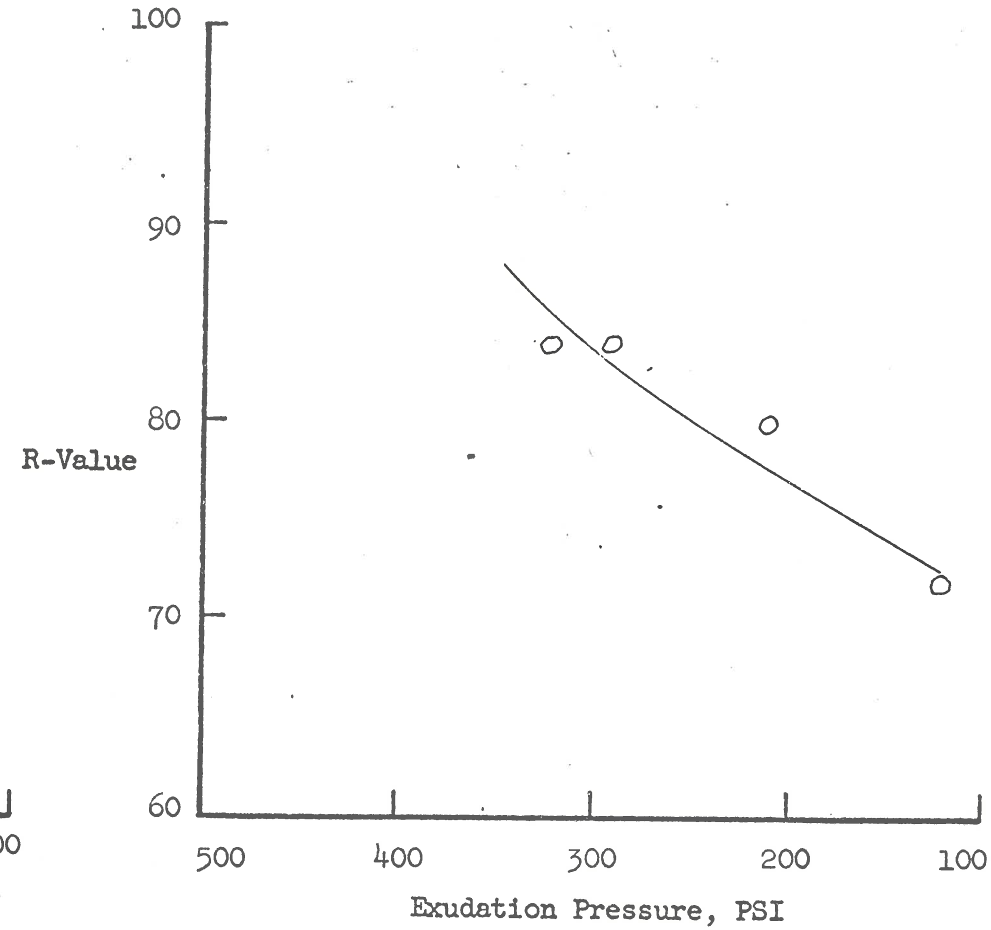


Summary of Data
California R-Value

Sample No.:	220
Date Tested:	4-26-67
Visual Description:	Gray Sandy Silt
R-Value at 240 PSI:	83
R-Value at 300 PSI:	83



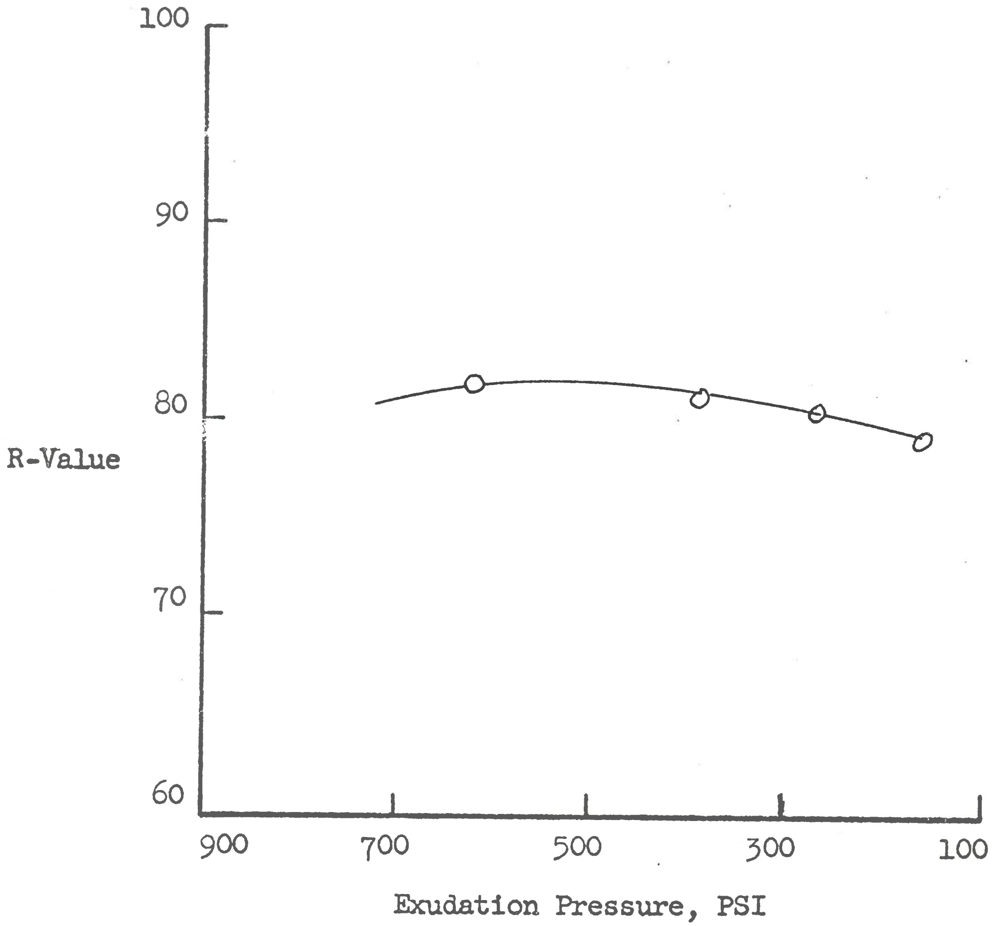
Sample No.:	221
Date Tested:	4-26-67
Visual Description:	Gray Sandy Silt
R-Value at 240 PSI:	80
R-Value at 300 PSI:	84



Summary of Data
California R-Value

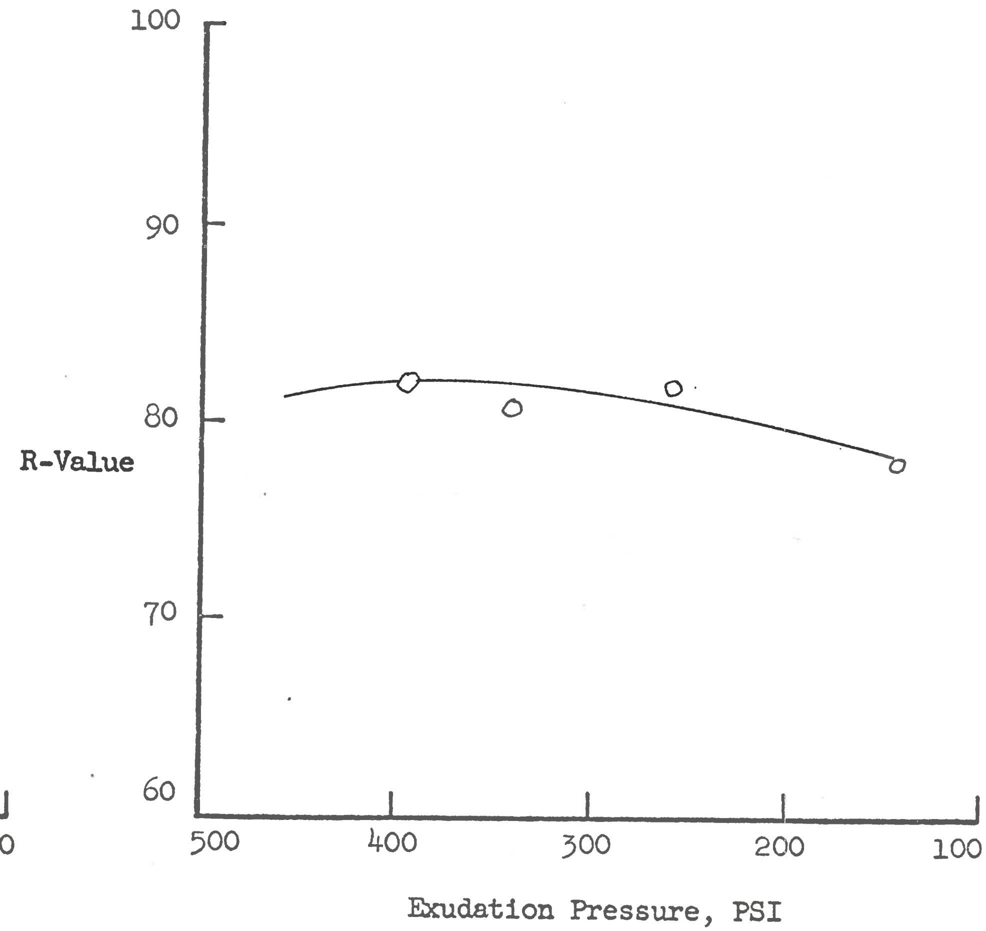
Sample No.: 222
Date Tested: 4-22-67
Visual Description: Yellow Sandy Clay

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



Sample No.: 223
Date Tested: 4-26-67
Visual Description: Gray Sandy Silt

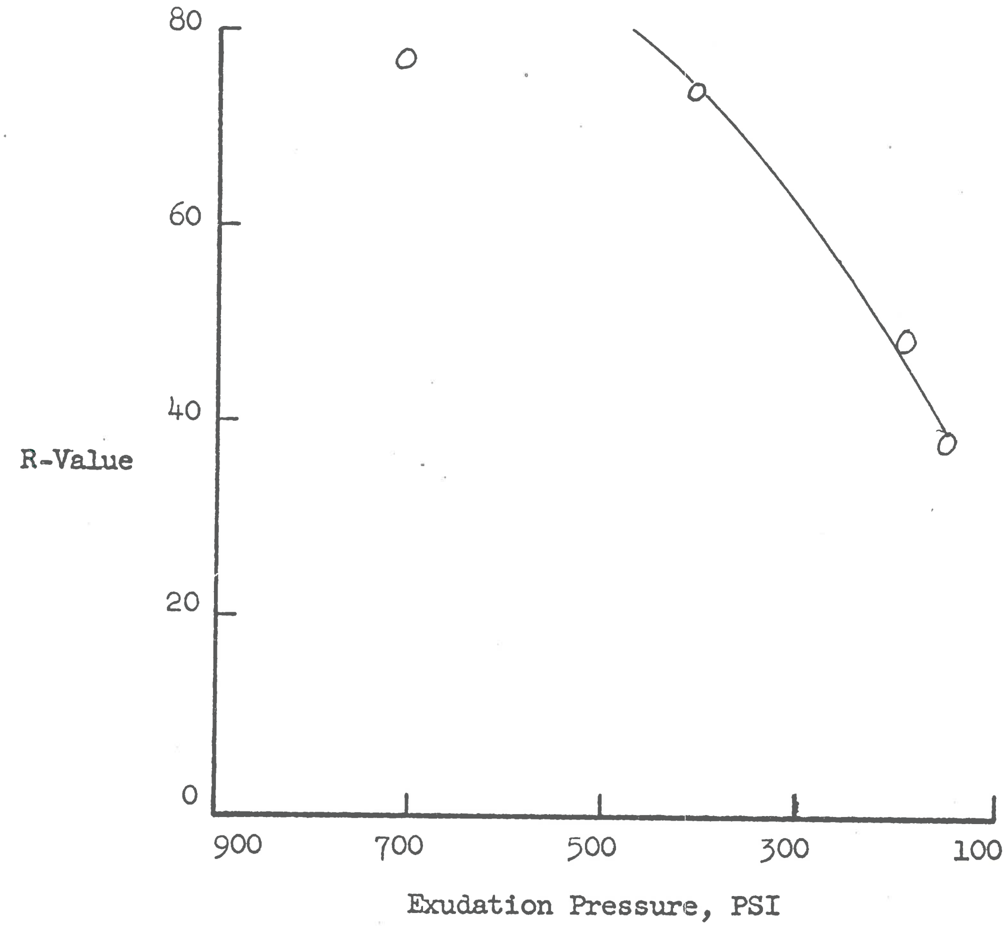
R-Value at 240 PSI: 80
R-Value at 300 PSI: 81



Summary of Data
California R-Value

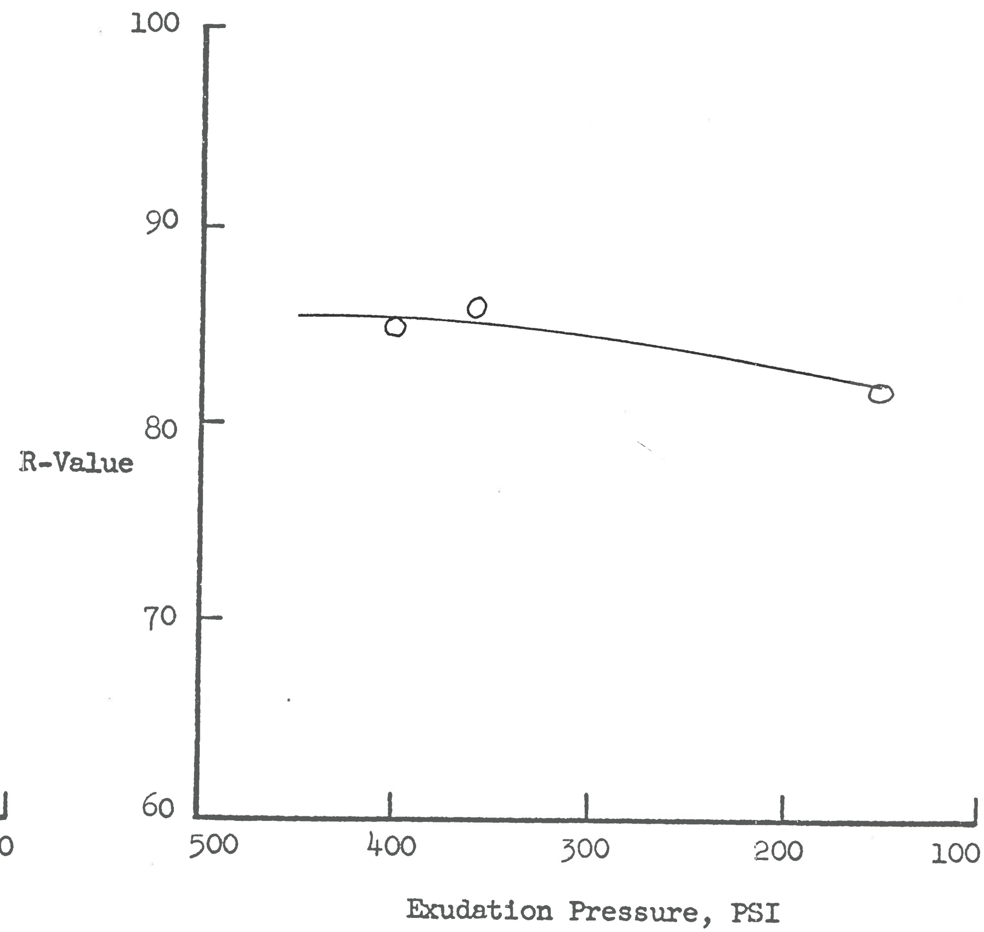
Sample No.: 224
Date Tested: 4-22-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 57
R-Value at 300 PSI: 65



Sample No.: 225
Date Tested: 4-27-67
Visual Description: Gray Sandy Silt

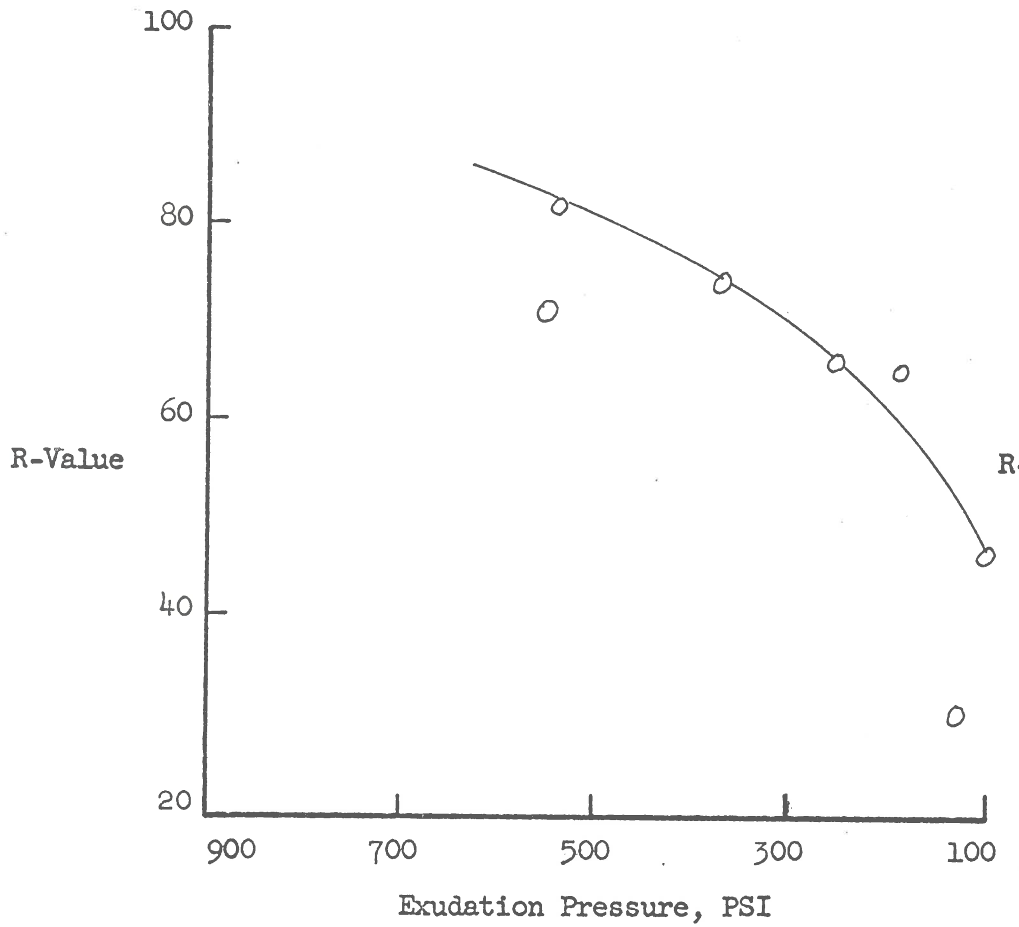
R-Value at 240 PSI: 83
R-Value at 300 PSI: 84



Summary of Data
California R-Value

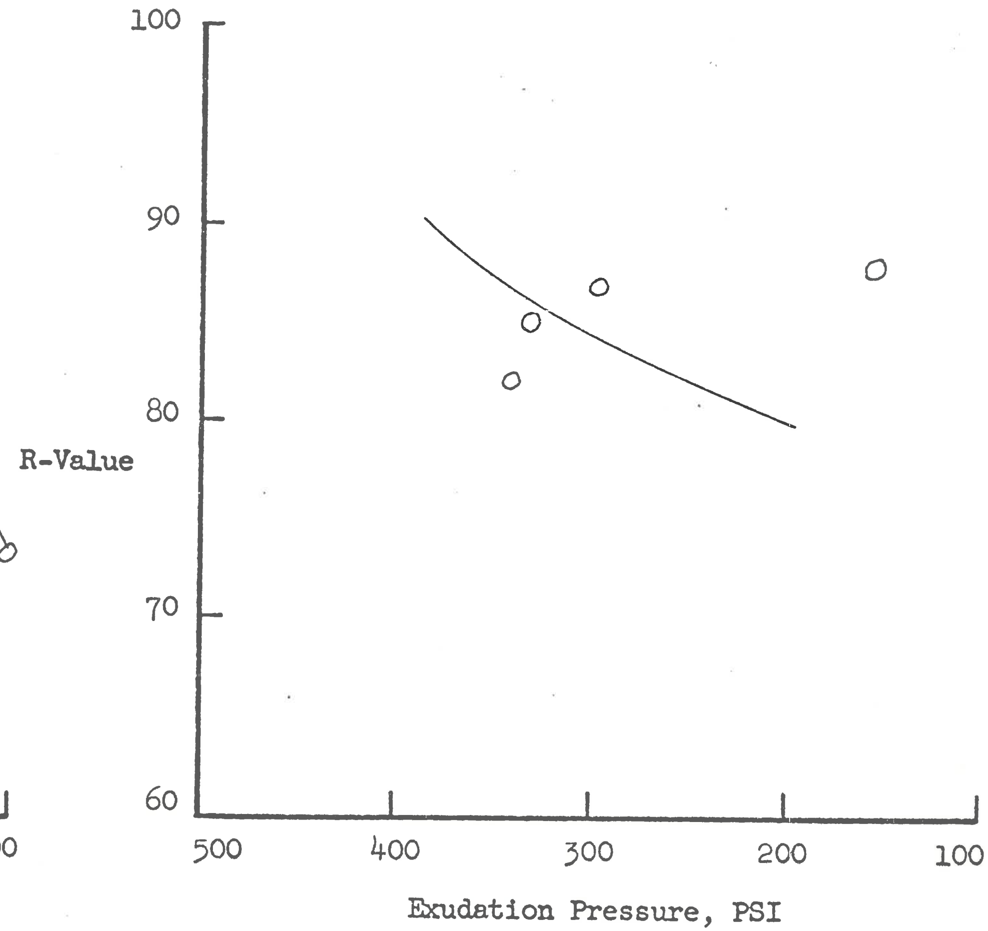
Sample No.: 226
Date Tested: 4-27-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 65
R-Value at 300 PSI: 71



Sample No.: 227
Date Tested: 4-27-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 81
R-Value at 300 PSI: 84



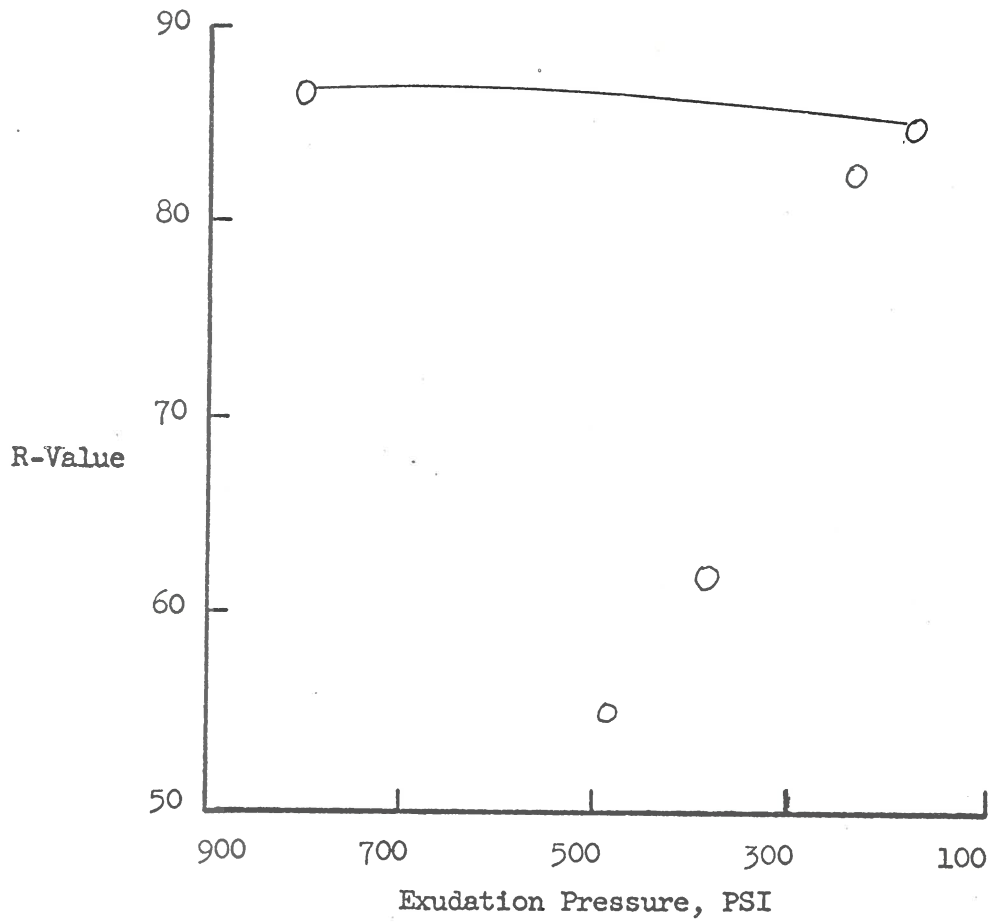
Summary of Data
California R-Value

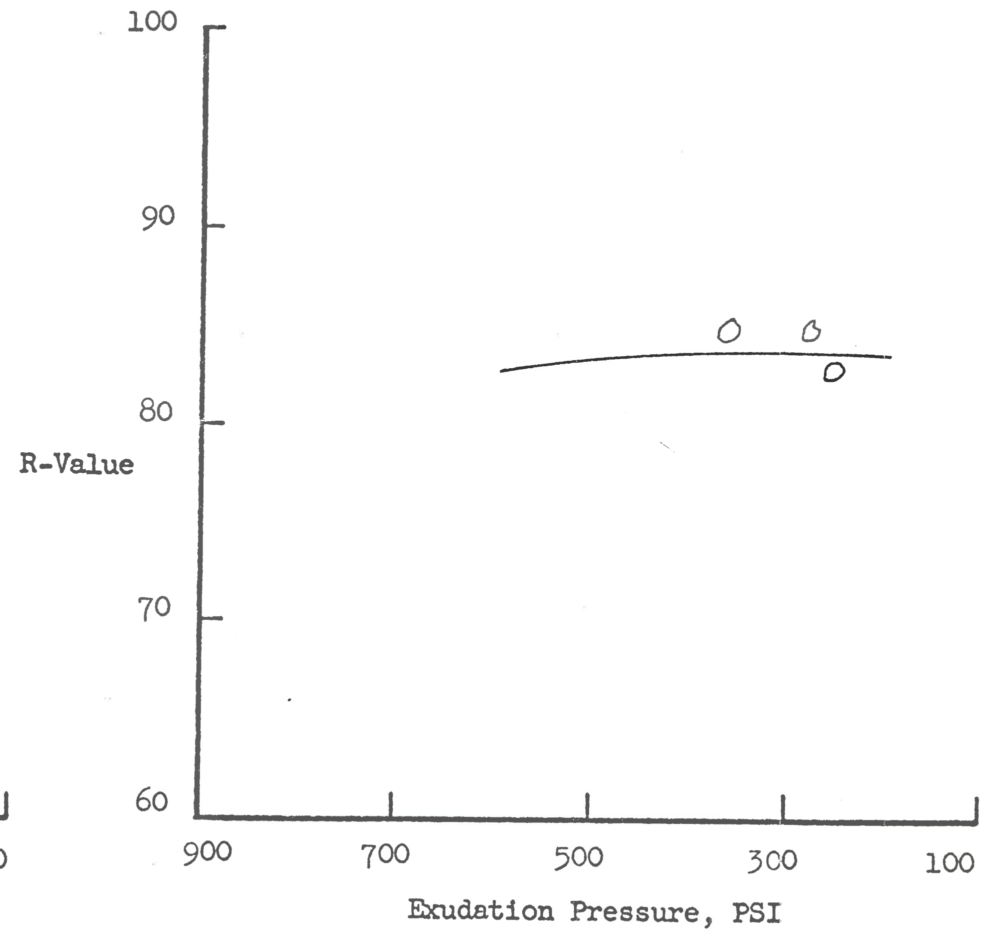
Sample No.: 228
Date Tested: 5-1-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 86
R-Value at 300 PSI: 86

Sample No.: 229
Date Tested: 5-1-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 84
R-Value at 300 PSI: 84

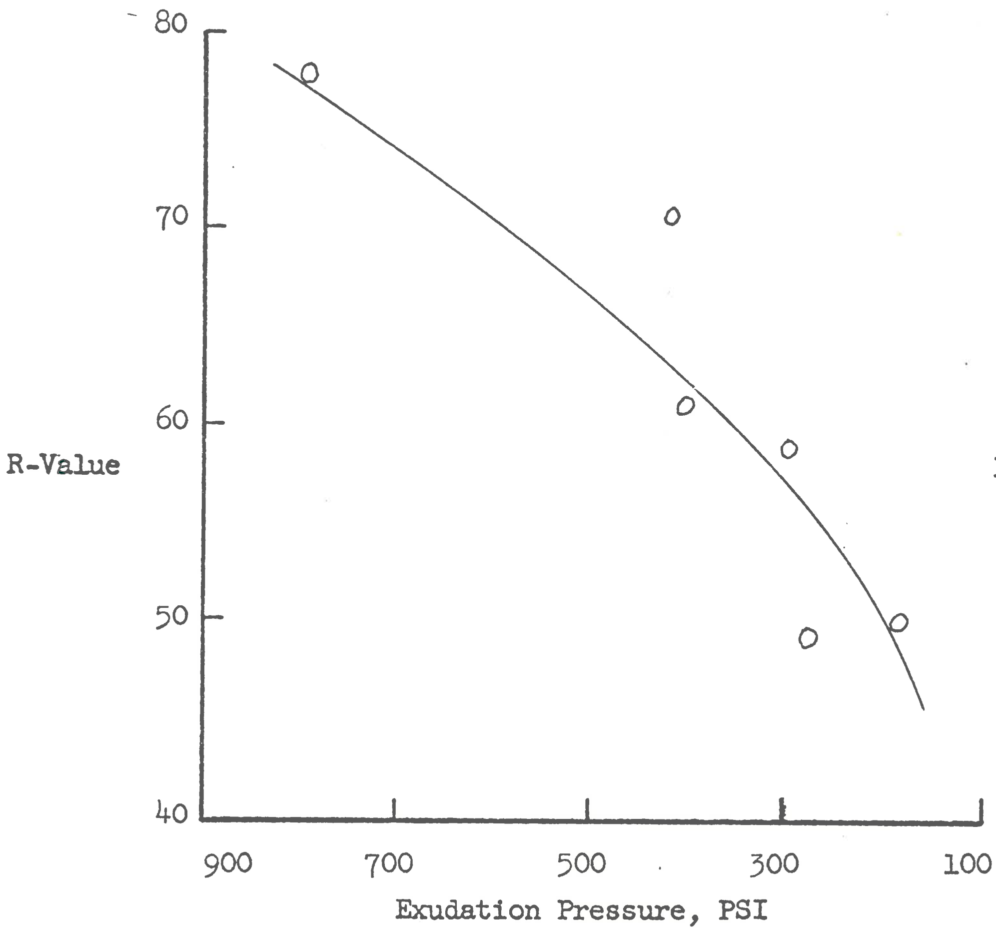




Summary of Data
California R-Value

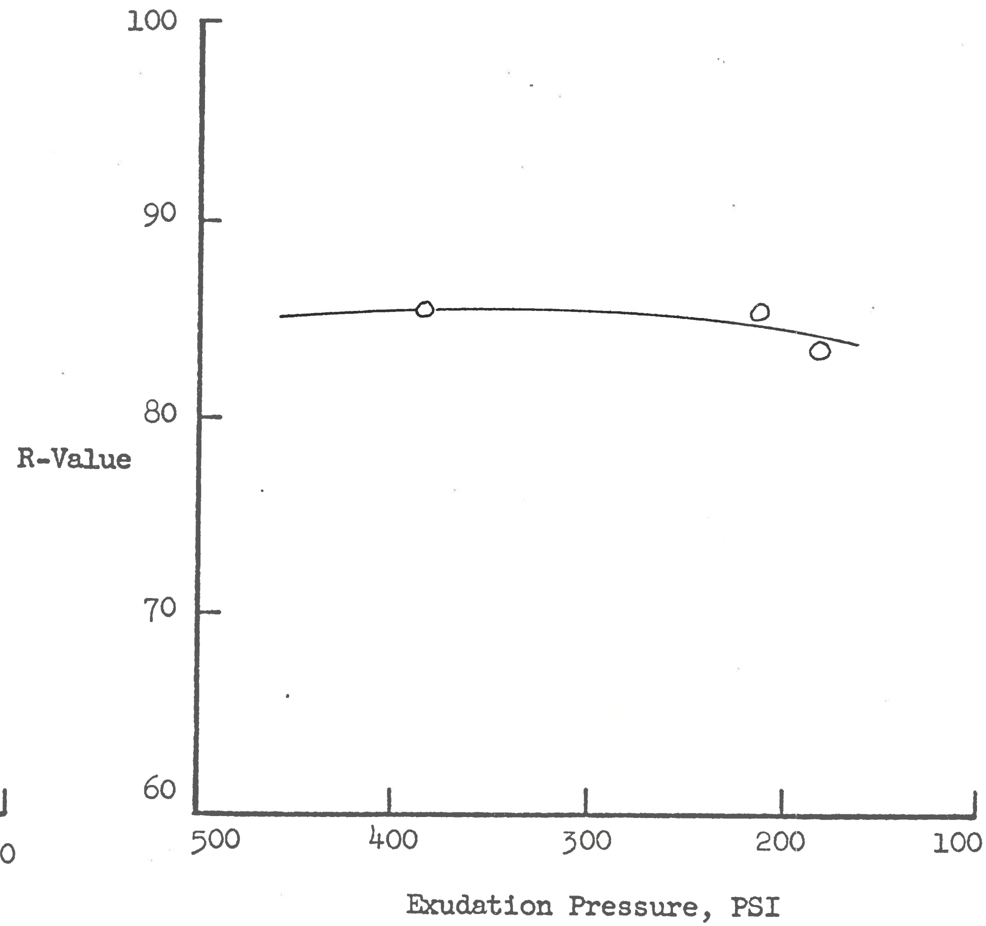
Sample No.: 230
Date Tested: 7-18-66
Visual Description: Brown Clayey Sand

R-Value at 240 PSI: 54
R-Value at 300 PSI: 59



Sample No.: 231
Date Tested: 5-1-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 85
R-Value at 300 PSI: 86



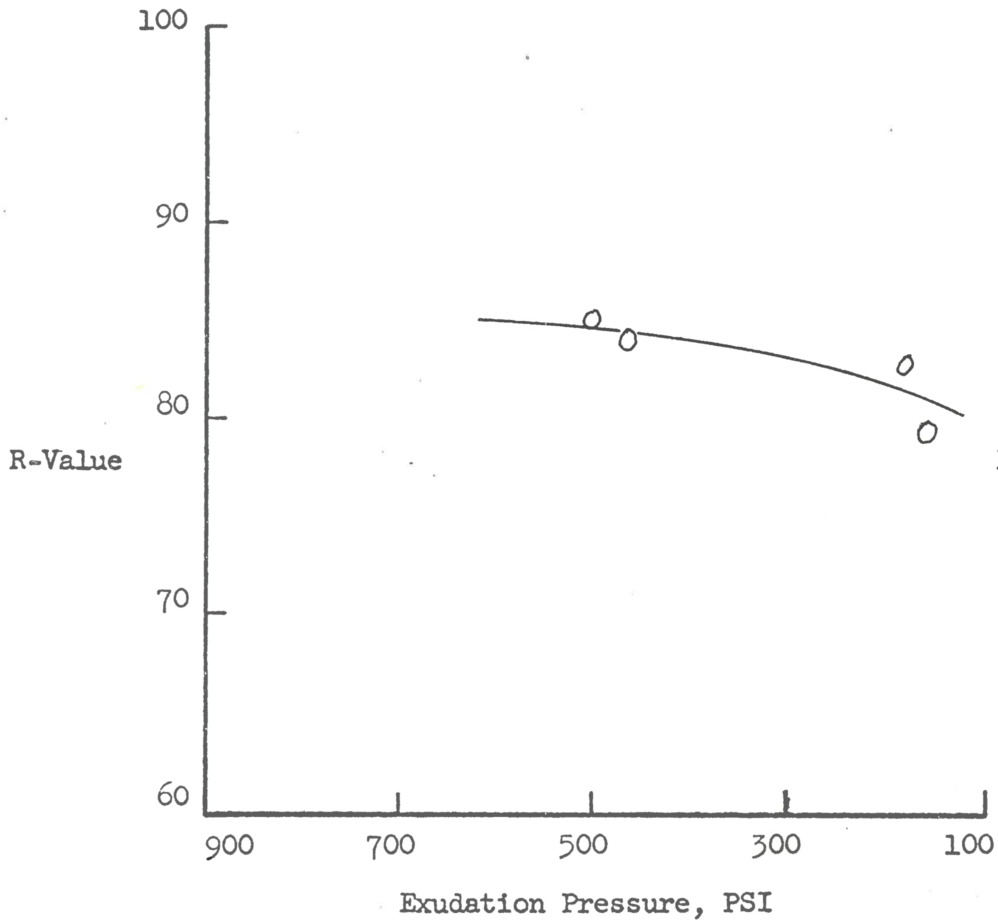
Summary of Data
California R-Value

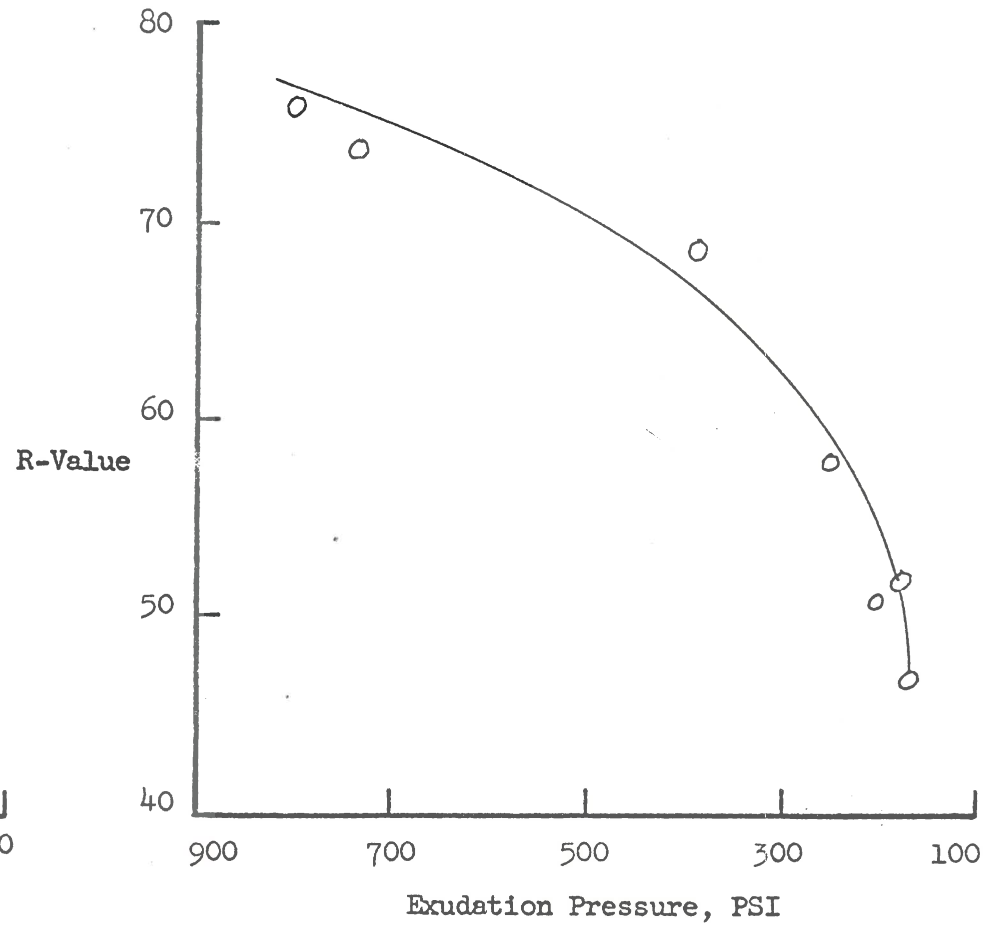
Sample No.: 232
Date Tested: 5-1-67
Visual Description: Gray Silt

R-Value at 240 PSI: 82
R-Value at 300 PSI: 83

Sample No.: 233
Date Tested: 5-1-67
Visual Description: Tan Sandy Silt

R-Value at 240 PSI: 58
R-Value at 300 PSI: 63

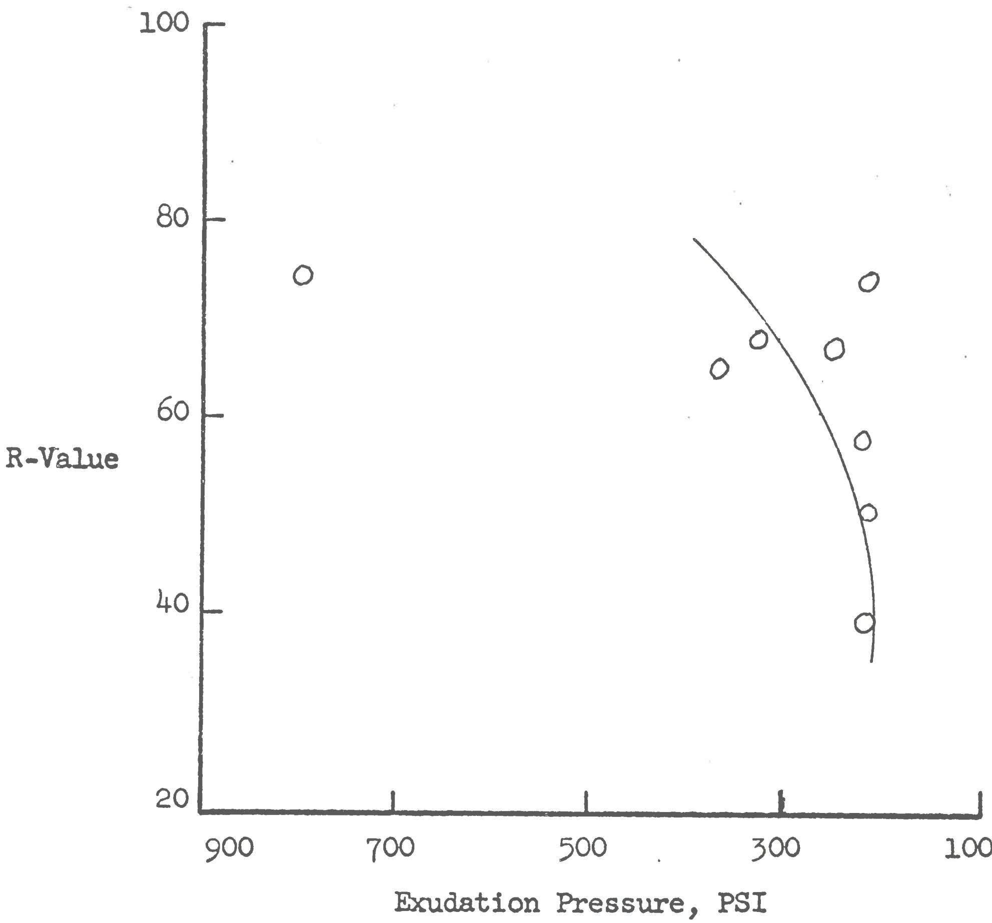


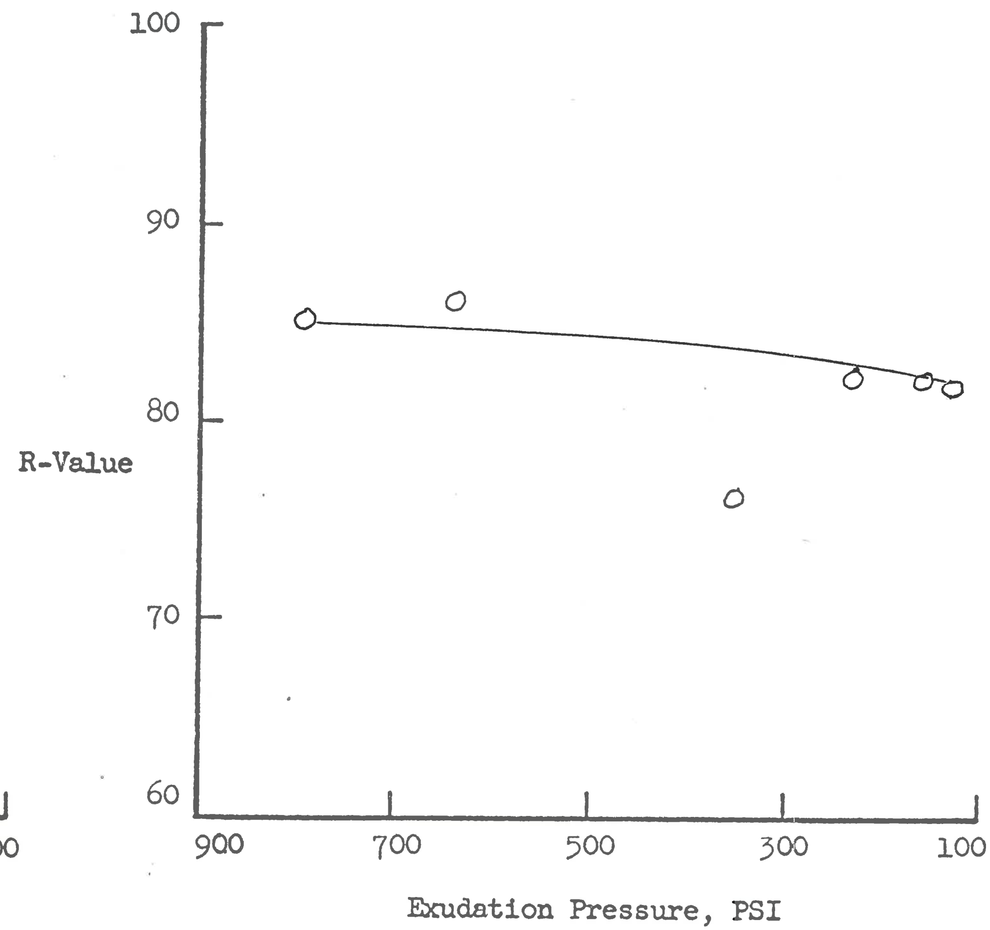


Summary of Data
California R-Value

Sample No.:	234
Date Tested:	5-1-67
Visual Description:	Sandy Silt with Gravel
R-Value at 240 PSI:	60
R-Value at 300 PSI:	64

Sample No.:	238
Date Tested:	5-18-67
Visual Description:	Gray Sandy Silt
R-Value at 240 PSI:	83
R-Value at 300 PSI:	83





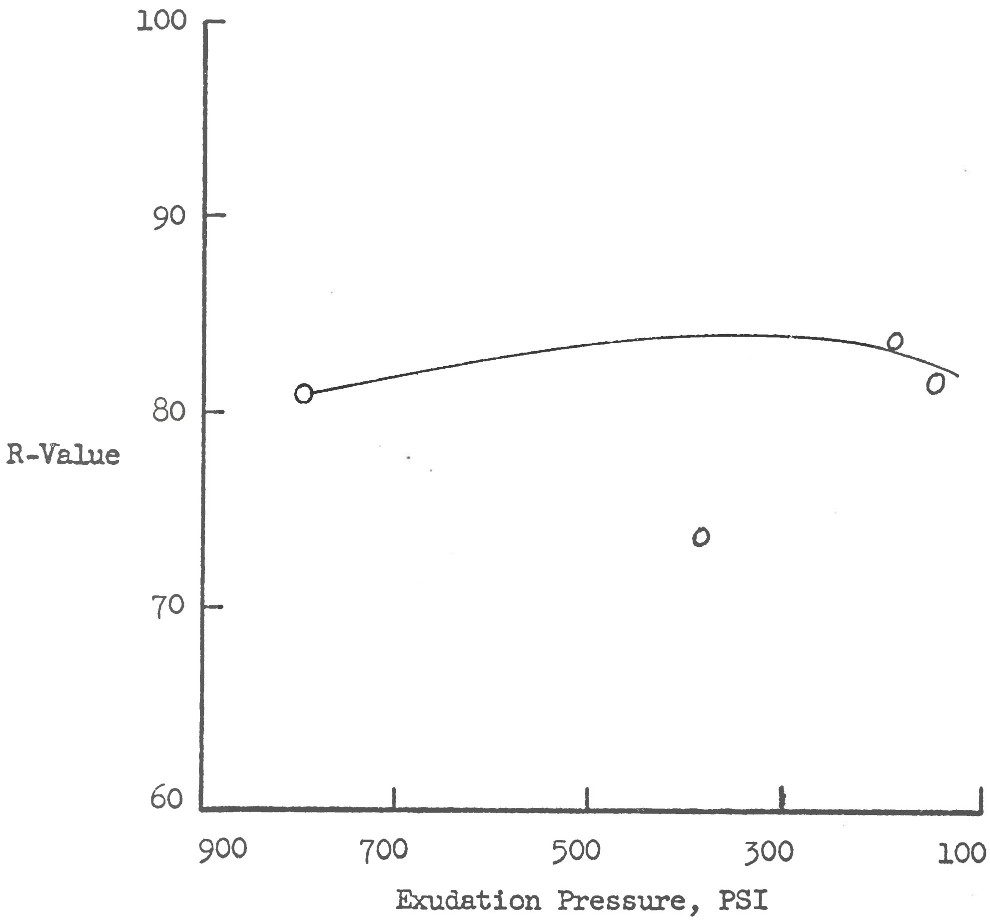
Summary of Data
California R-Value

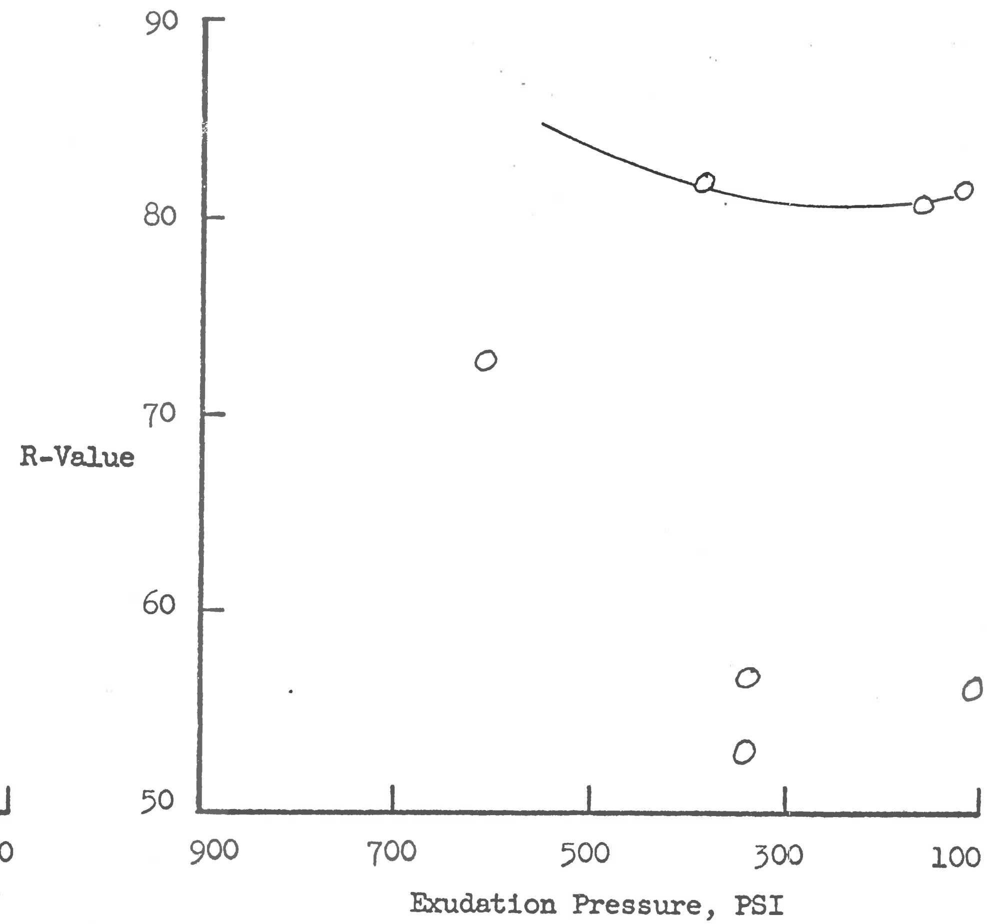
Sample No.: 239
Date Tested: 5-18-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 84
R-Value at 300 PSI: 84

Sample No.: 240
Date Tested: 5-18-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 81
R-Value at 300 PSI: 81

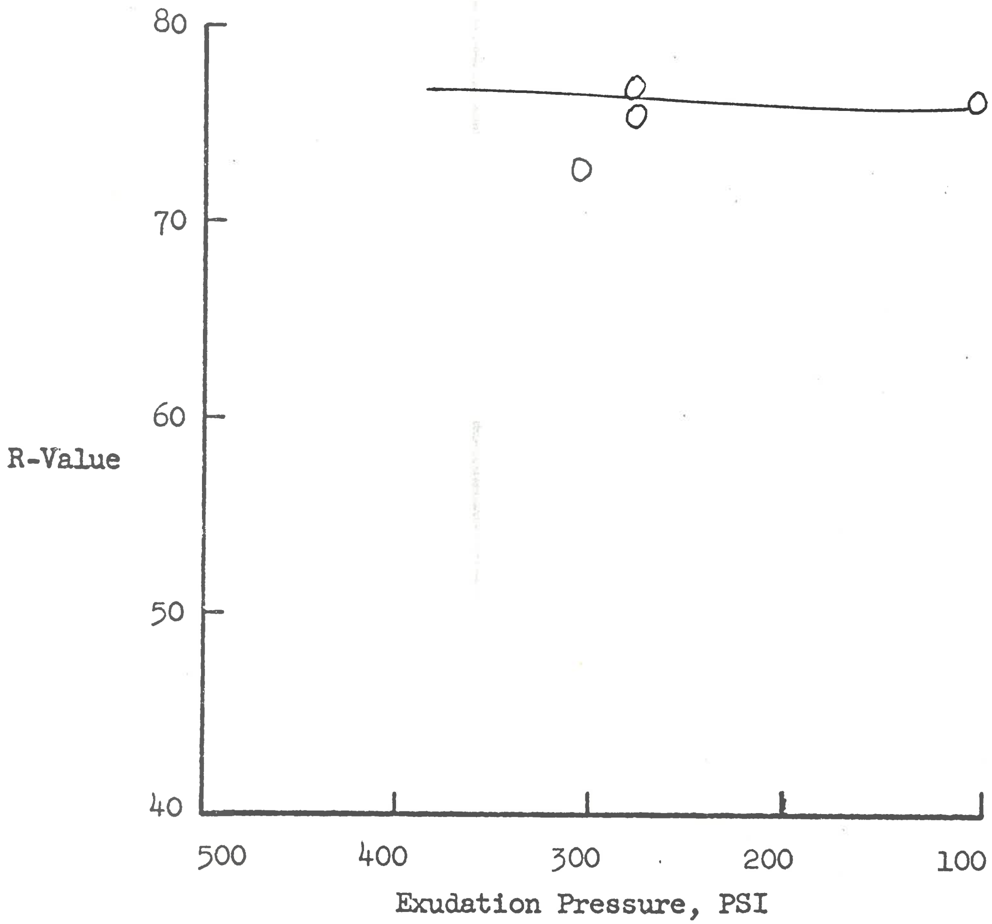




Summary of Data
California R-Value

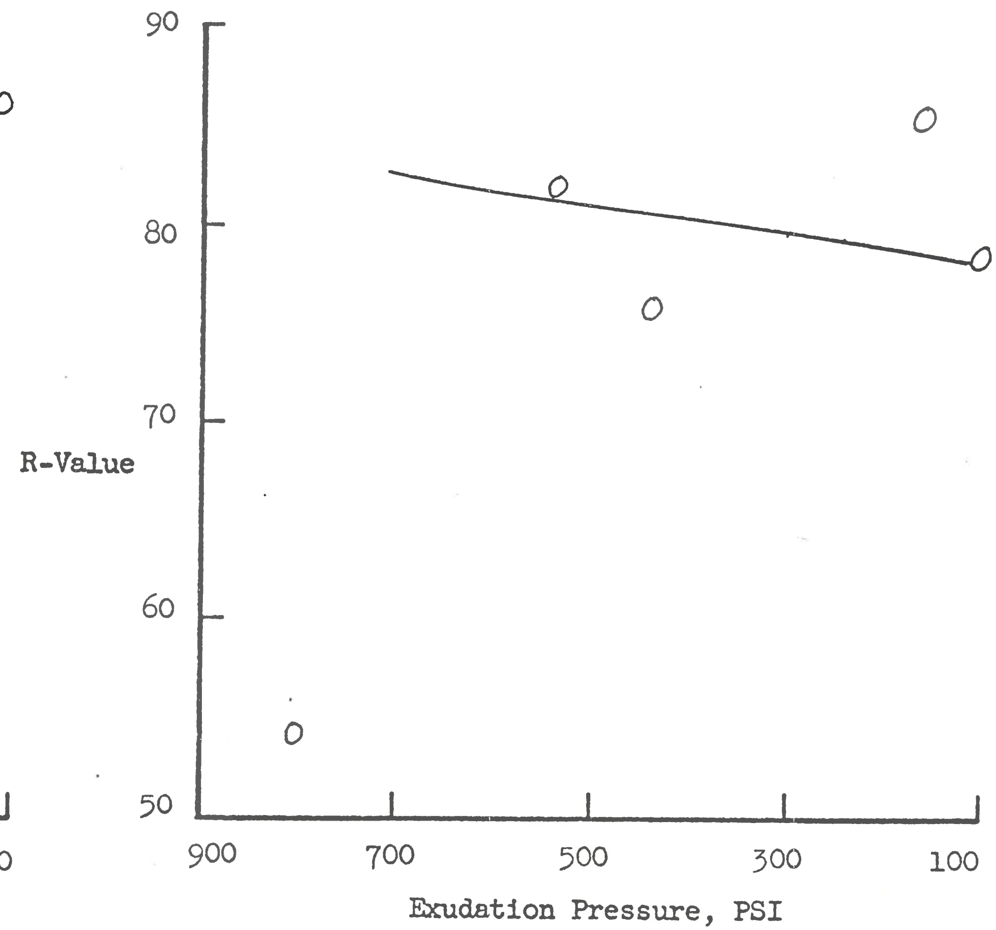
Sample No.: 241
Date Tested: 5-18-67
Visual Description: Gray Sandy Silt

R-Value at 240 PSI: 78
R-Value at 300 PSI: 77



Sample No.: 242
Date Tested: 8-18-67
Visual Description: Gray Sandy Silt

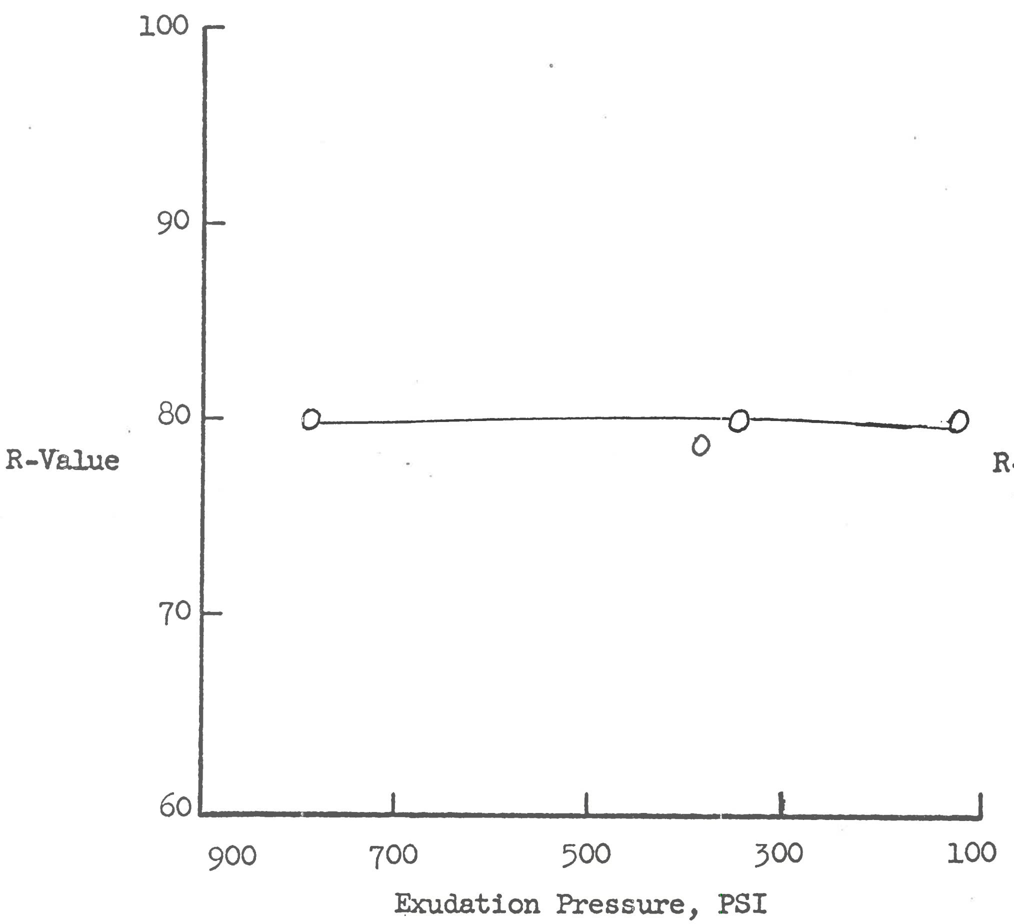
R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



Summary of Data
California R-Value

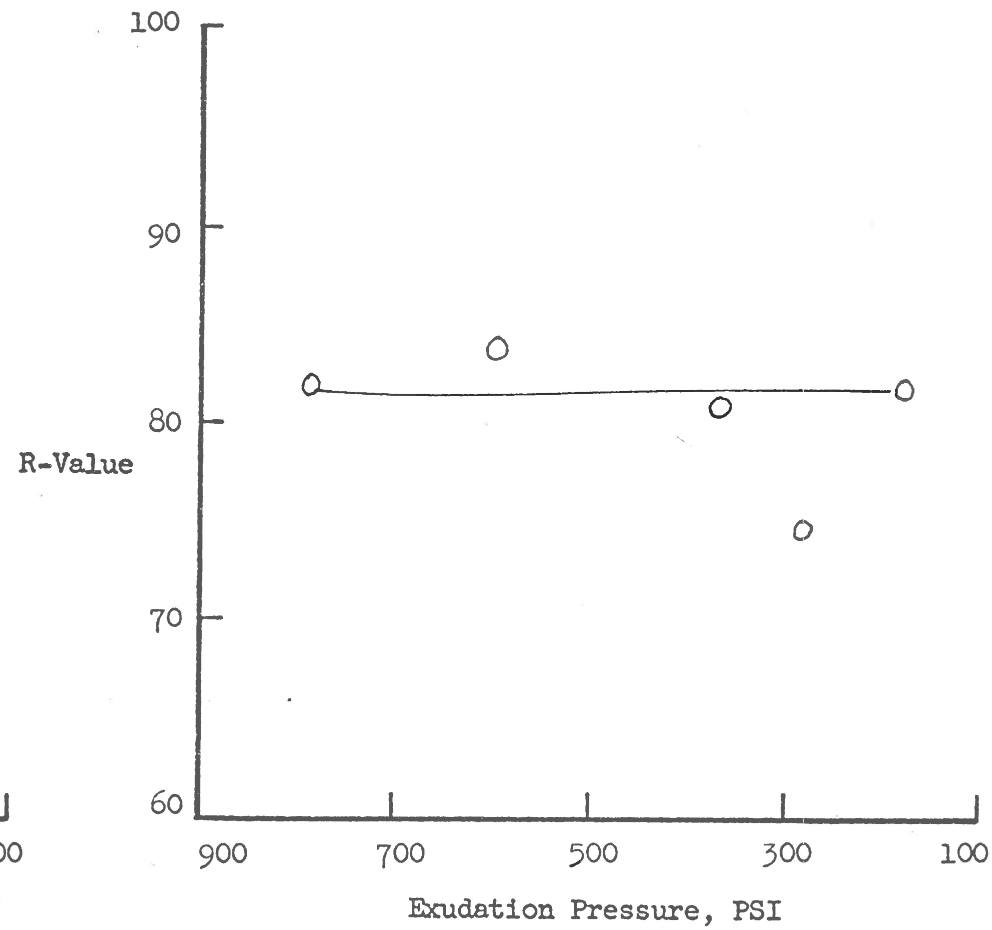
Sample No.: 243
Date Tested: 5-18-67
Visual Description: Gray Silt

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



Sample No.: 244
Date Tested: 5-18-67
Visual Description: Crushed L mestone

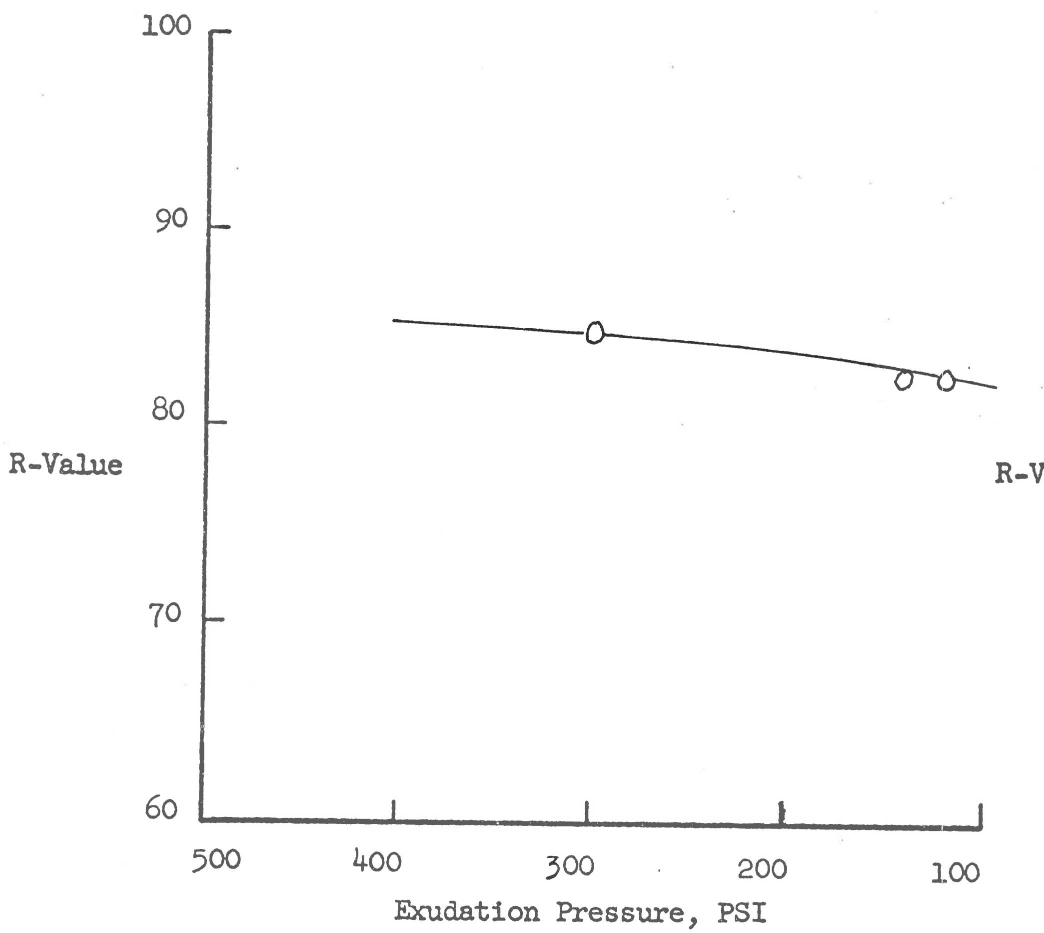
R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



Summary of Data
California R-Value

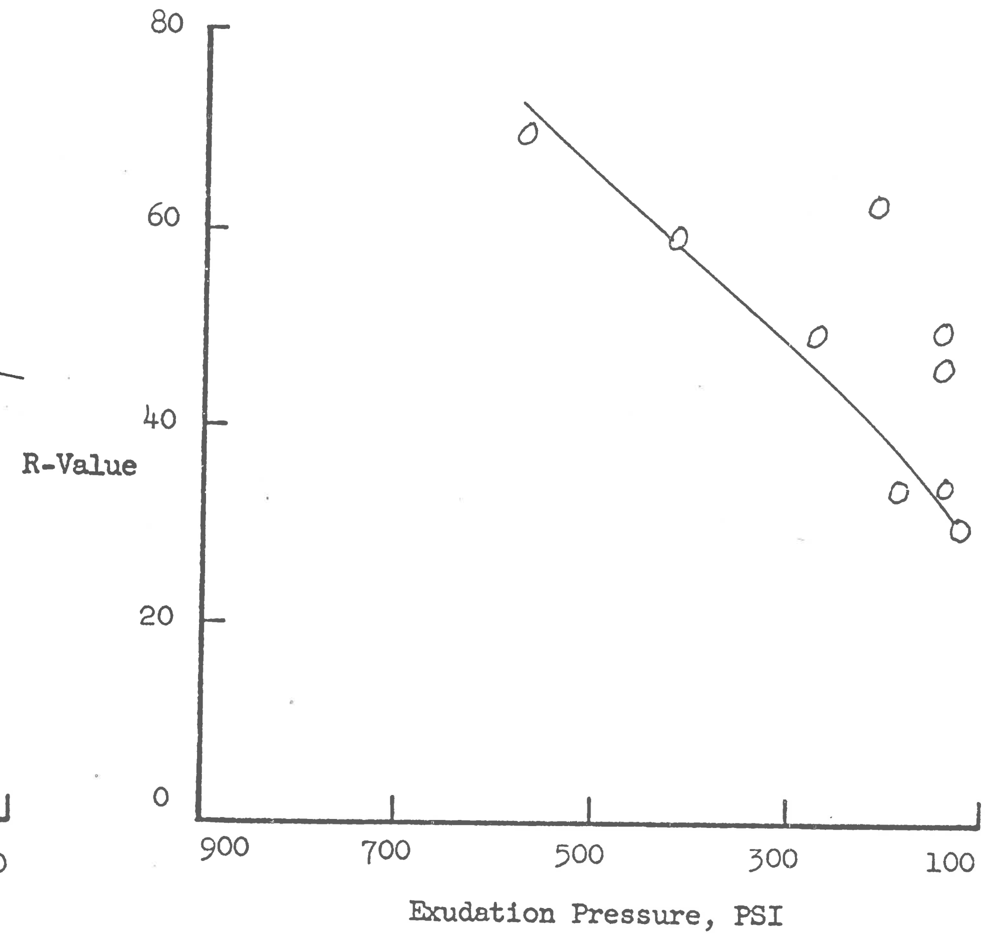
Sample No.: 248
Date Tested: 5-18-67
Visual Description: Crushed Limestone

R-Value at 240 PSI: 84
R-Value at 300 PSI: 85



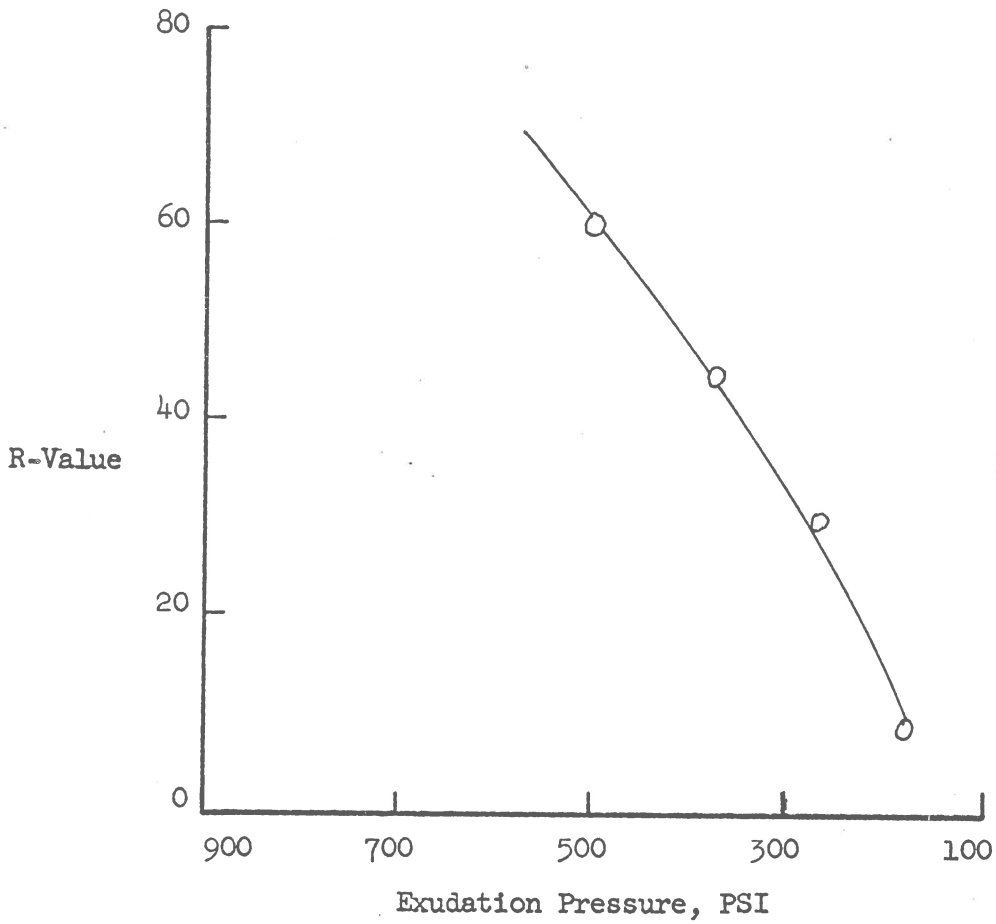
Sample No.: 249
Date Tested: 4-22-67
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 42
R-Value at 300 PSI: 49

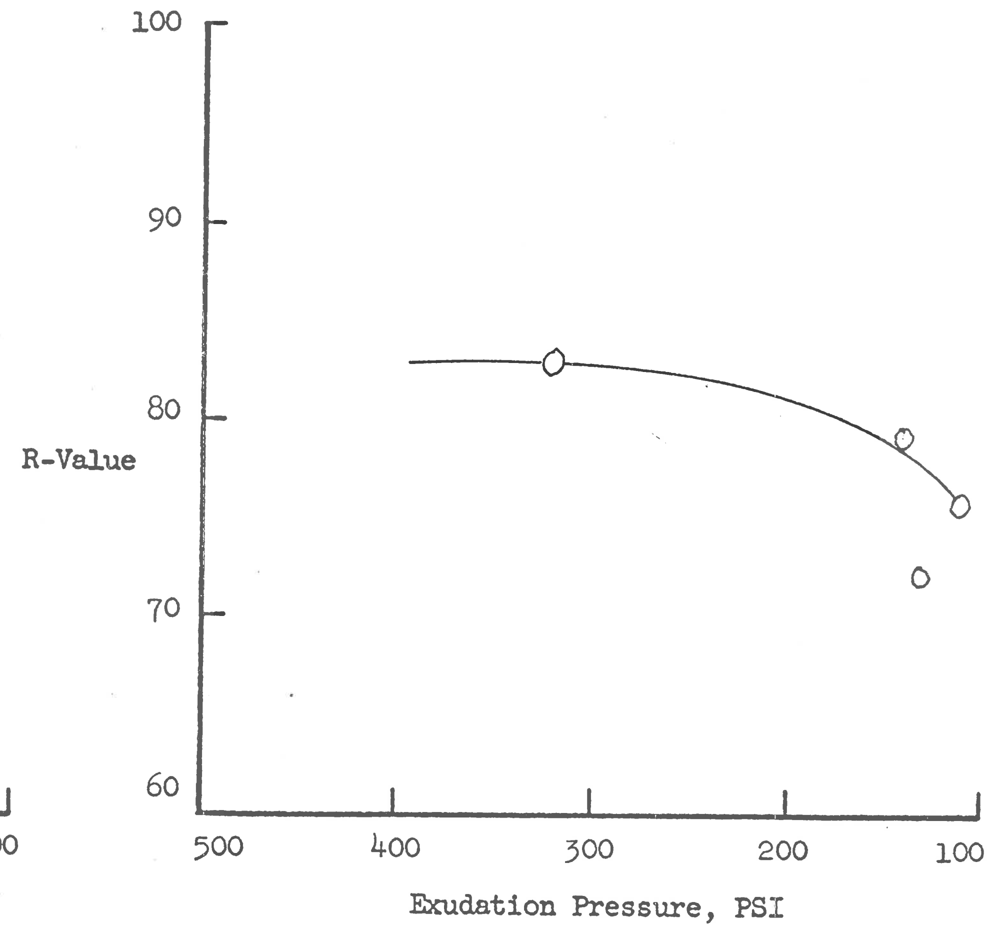


Summary of Data
California R-Value

Sample No.:	250
Date Tested:	7-22-66
Visual Description:	Red Clay
R-Value at 240 PSI:	25
R-Value at 300 PSI:	34



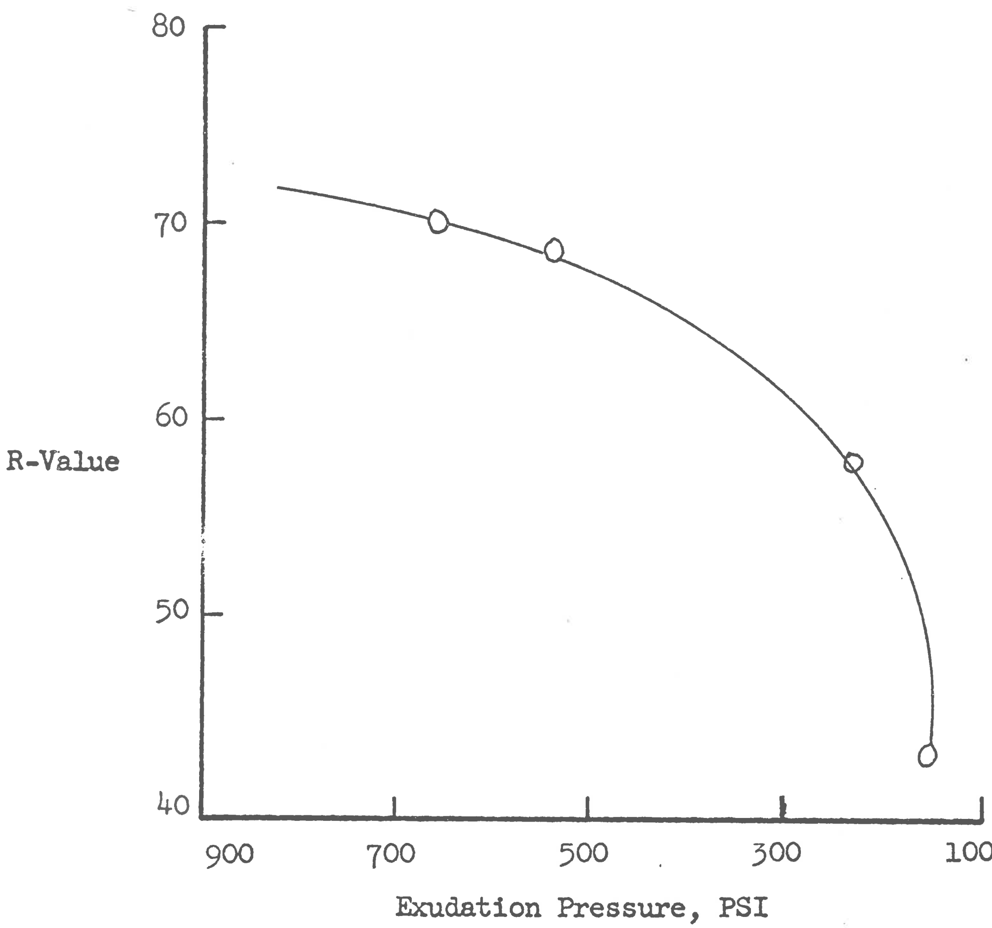
Sample No.:	251
Date Tested:	5-5-66
Visual Description:	Tan Clayey Sand
R-Value at 240 PSI:	82
R-Value at 300 PSI:	82



Summary of Data
California R-Value

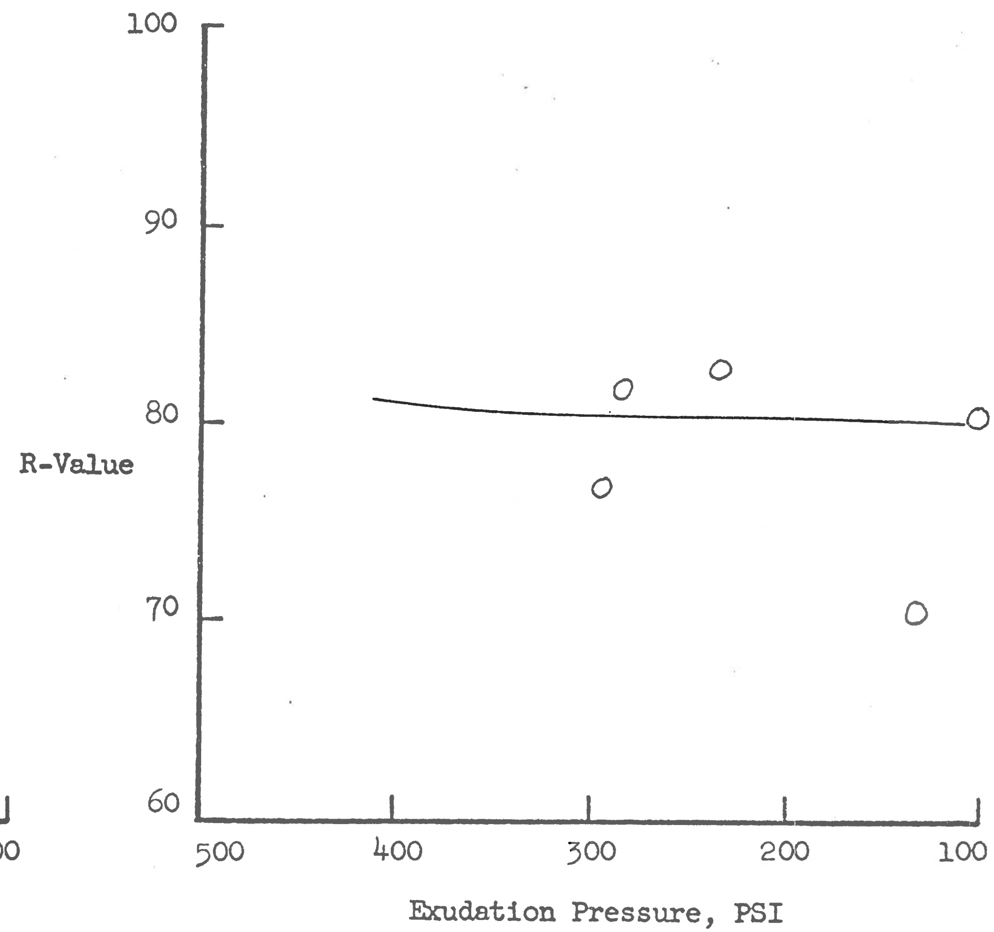
Sample No.: 252
Date Tested: 4-22-67
Visual Description: Tan Sandy Clay

R-Value at 240 PSI: 59
R-Value at 300 PSI: 63



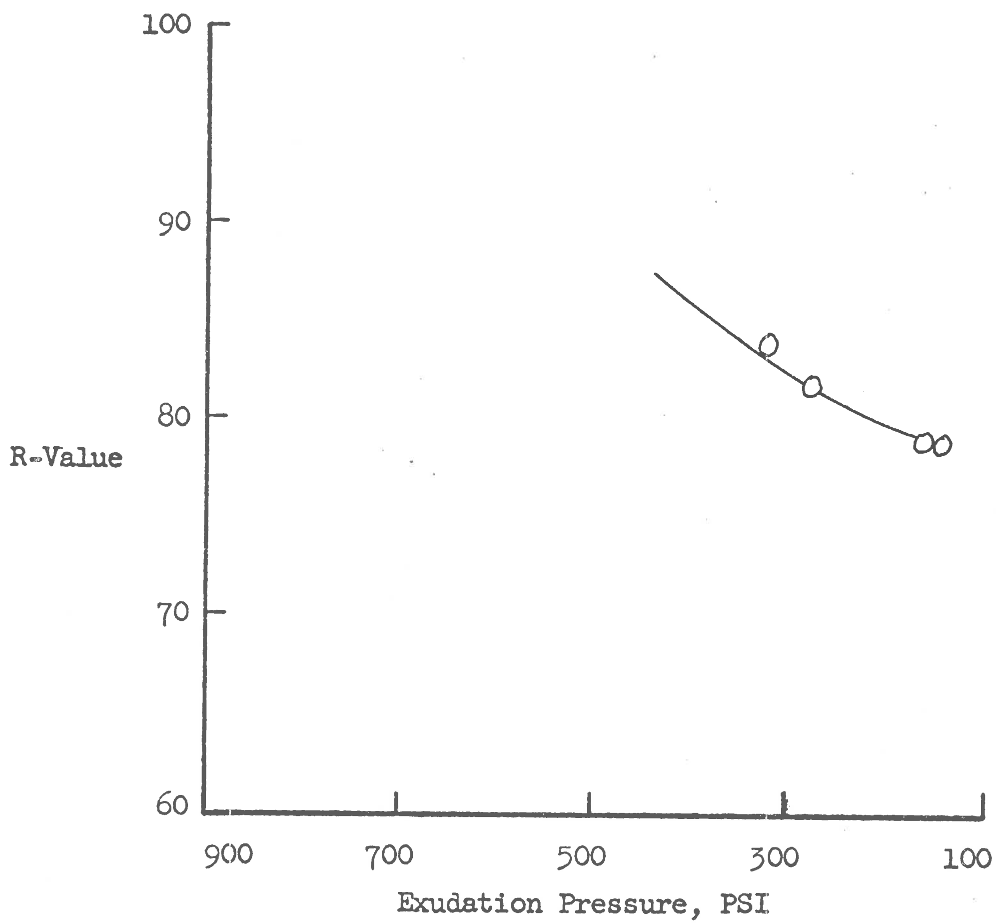
Sample No.: 253
Date Tested: 4-22-67
Visual Description: Gray Silty Sand

R-Value at 240 PSI: 81
R-Value at 300 PSI: 81

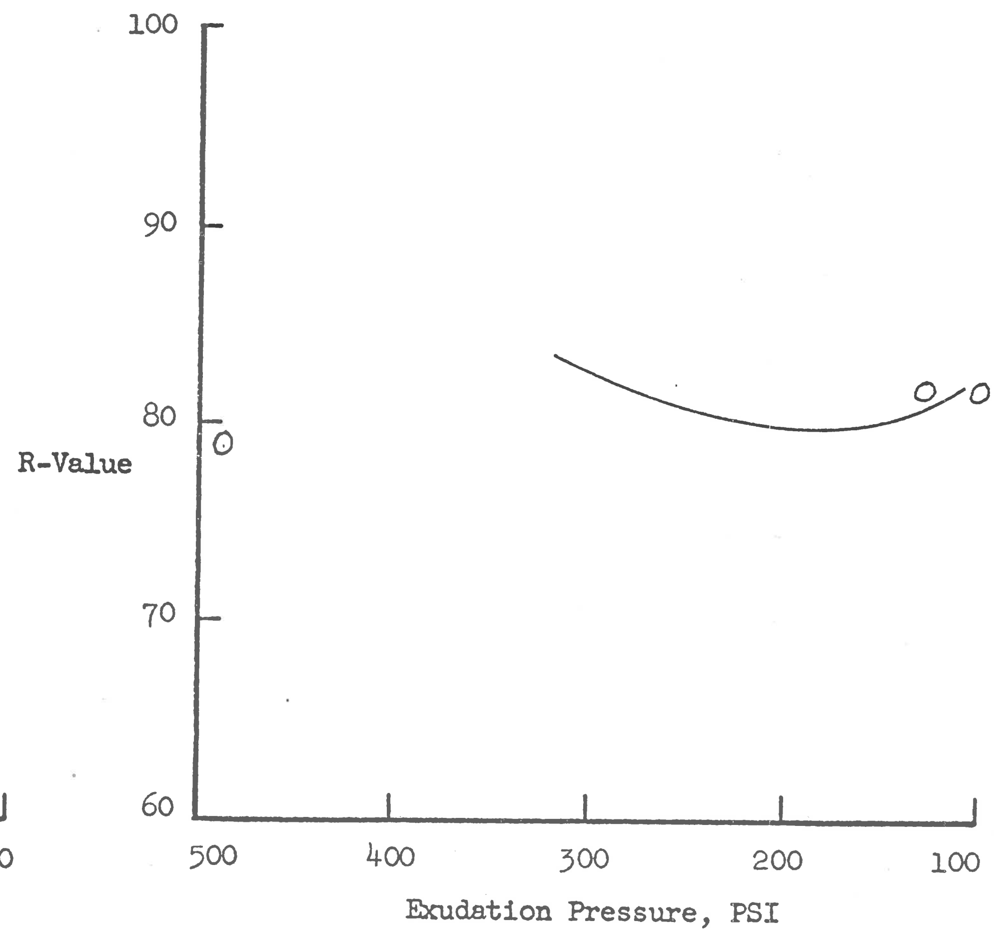


Summary of Data
California R-Value

Sample No.:	255
Date Tested:	5-18-67
Visual Description:	Gray Sandy Silt
R-Value at 240 PSI:	81
R-Value at 300 PSI:	81



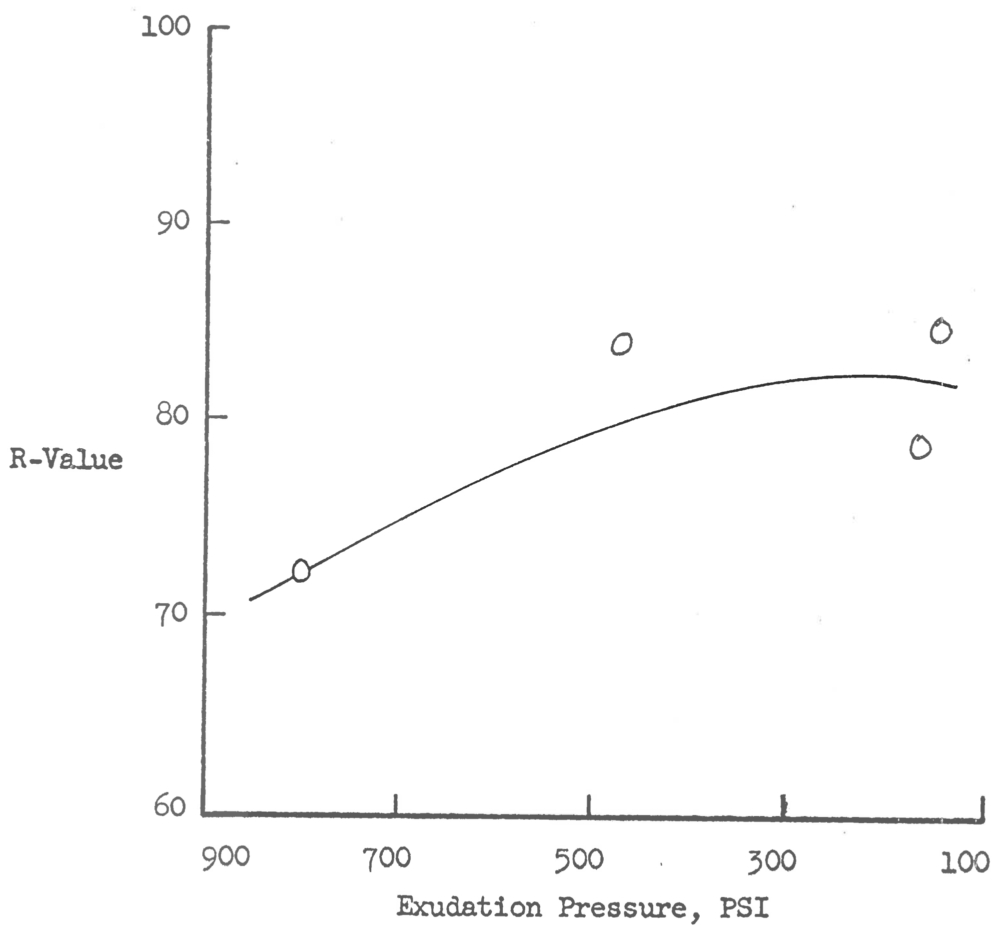
Sample No.:	256
Date Tested:	5-18-67
Visual Description:	Gray Silty Sand
R-Value at 240 PSI:	81
R-Value at 300 PSI:	83



Summary of Data
California R-Value

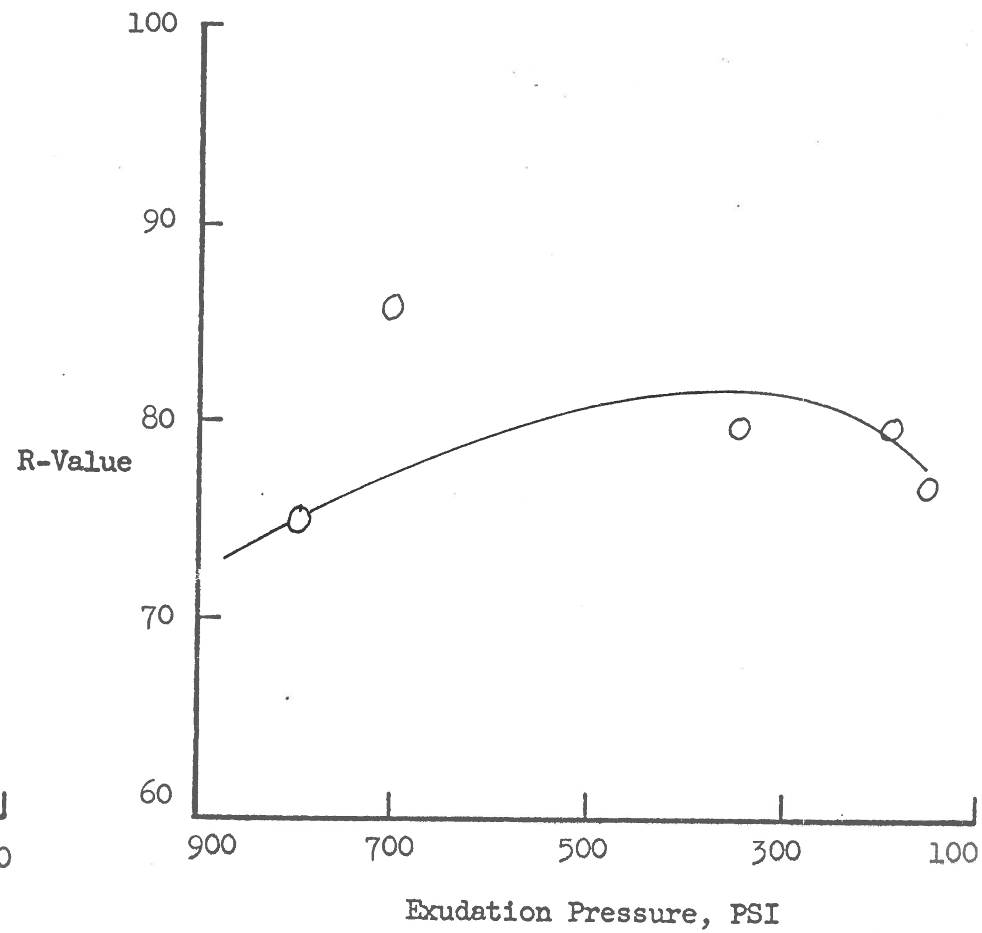
Sample No.: 258
Date Tested: 5-18-67
Visual Description: Gray Silt

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



Sample No.: 262
Date Tested: 5-18-67
Visual Description: Tan Silty Sand

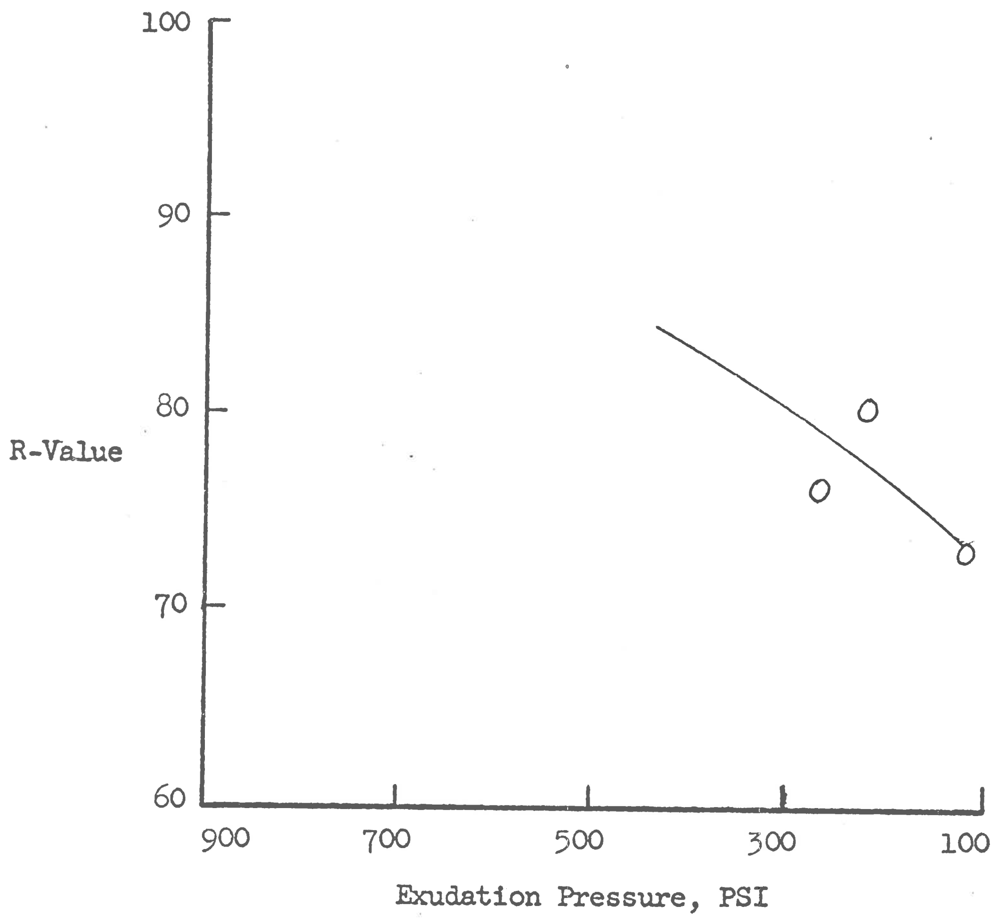
R-Value at 240 PSI: 81
R-Value at 300 PSI: 82



Summary of Data
California R-Value

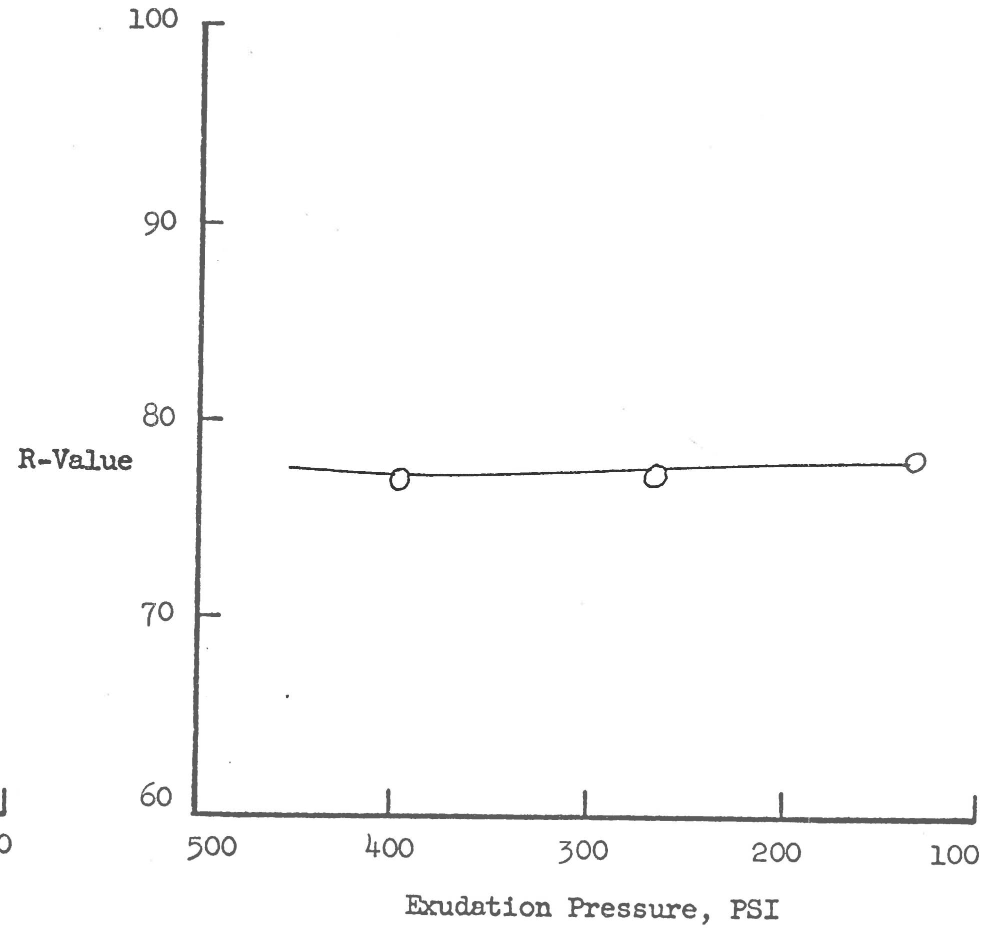
Sample No.: 264
Date Tested: 5-18-67
Visual Description: Tan Silty Sand

R-Value at 240 PSI: 79
R-Value at 300 PSI: 80



Sample No.: 265
Date Tested: 5-18-67
Visual Description: Silty Sand with Gravel

R-Value at 240 PSI: 78
R-Value at 300 PSI: 80



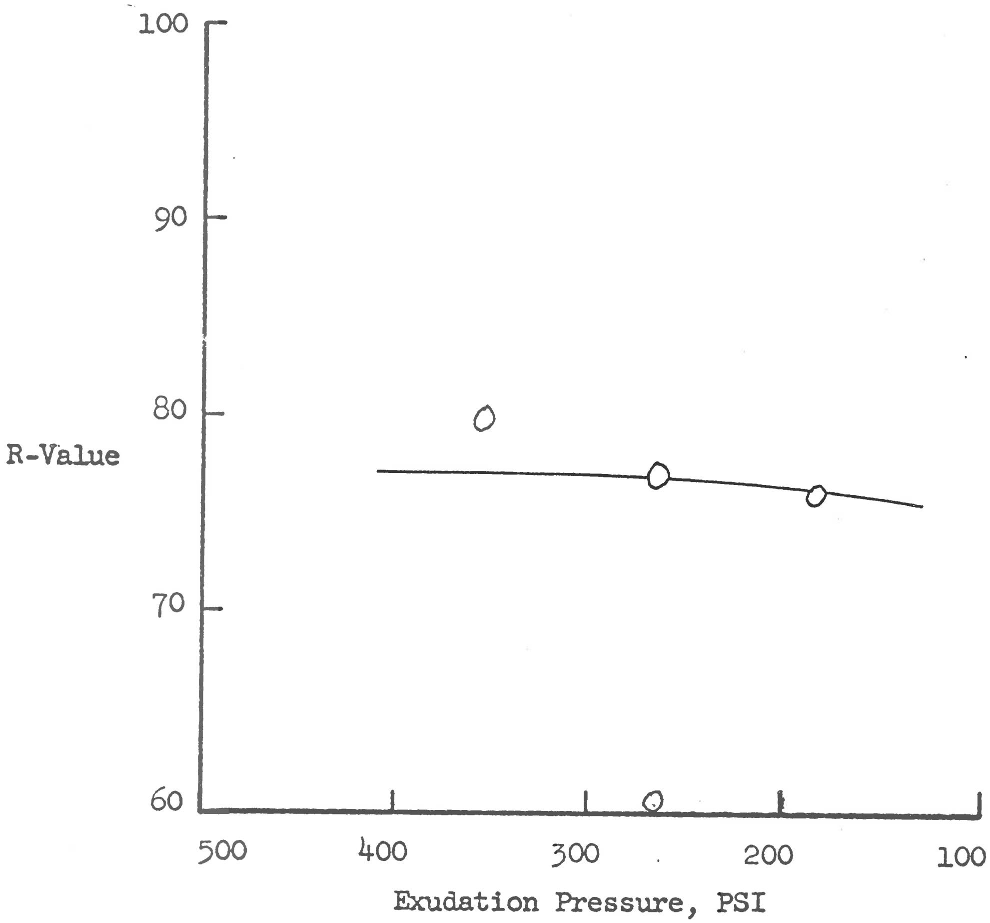
Summary of Data
California R-Value

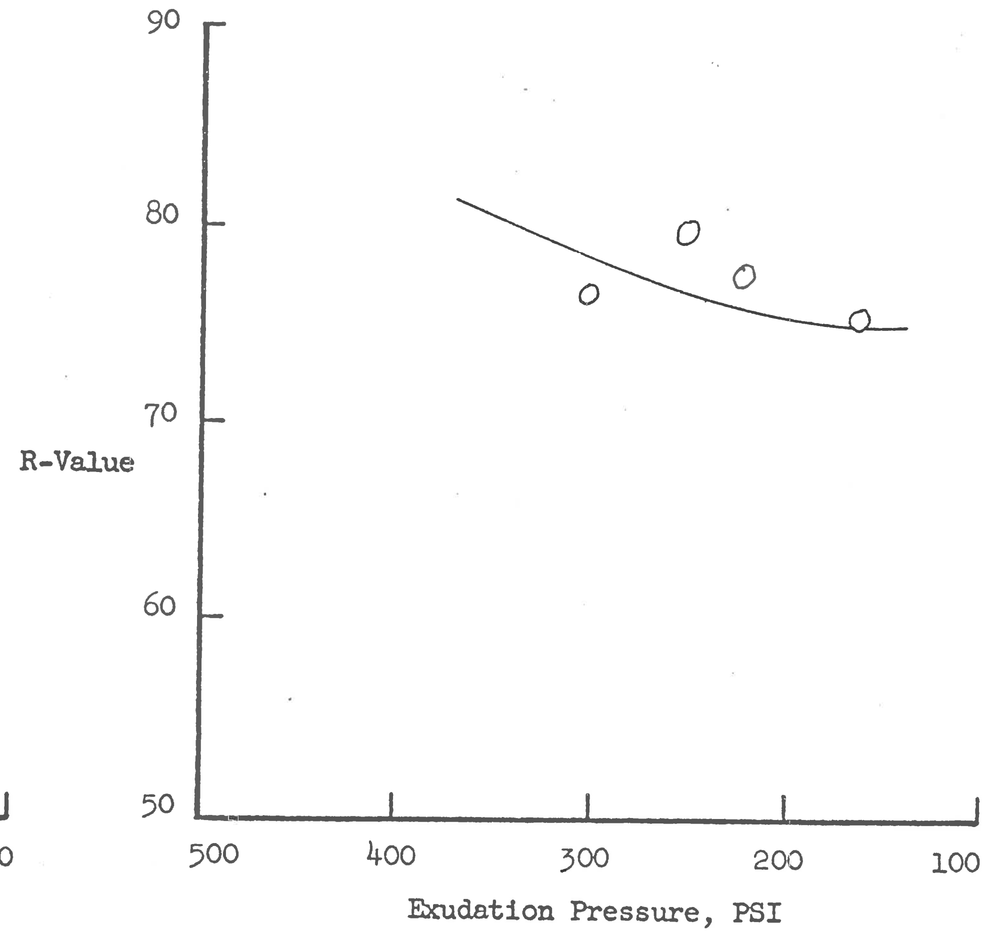
Sample No.: 268
Date Tested: 5-18-67
Visual Description: Tan Silty Sand

R-Value at 240 PSI: 77
R-Value at 300 PSI: 77

Sample No.: 270
Date Tested: 5-18-67
Visual Description: Silty Sand with Gravel

R-Value at 240 PSI: 77
R-Value at 300 PSI: 79

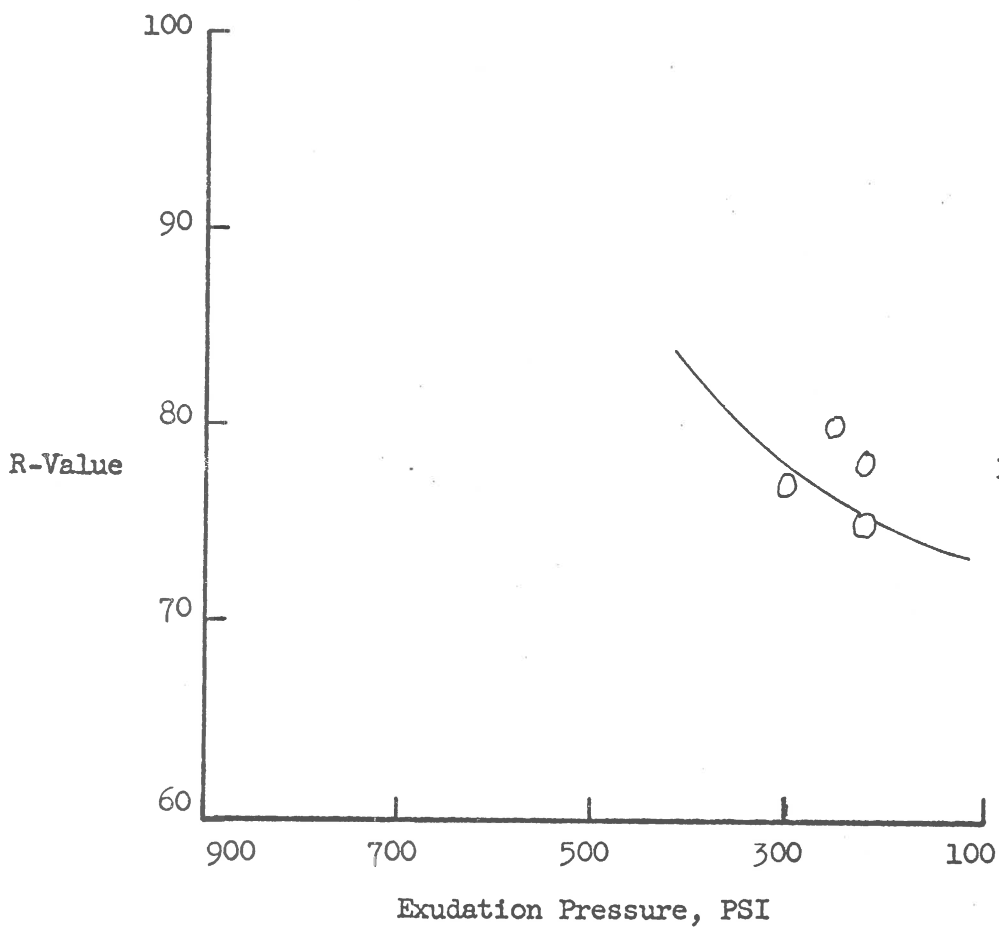




Summary of Data
California R-Value

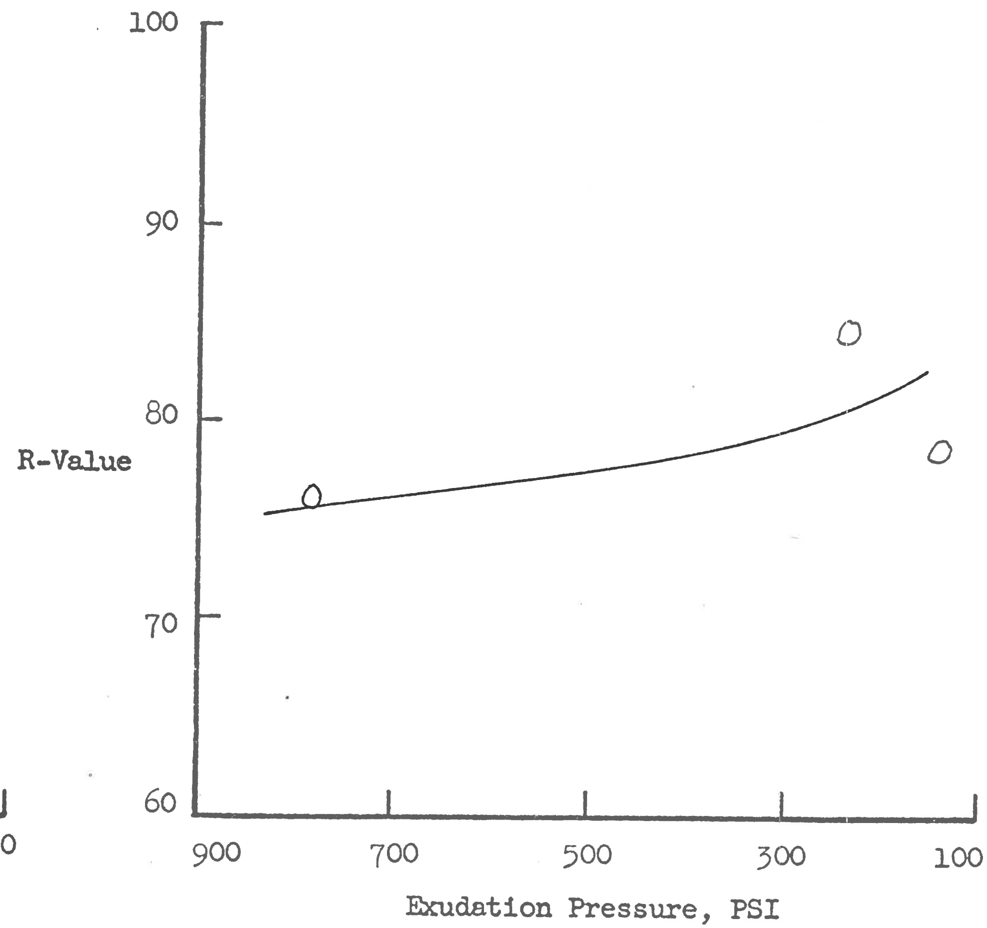
Sample No.: 271
Date Tested: 5-18-67
Visual Description: Tan Silt

R-Value at 240 PSI: 78
R-Value at 300 PSI: 78



Sample No.: 272
Date Tested: 5-18-67
Visual Description: Tan Silt

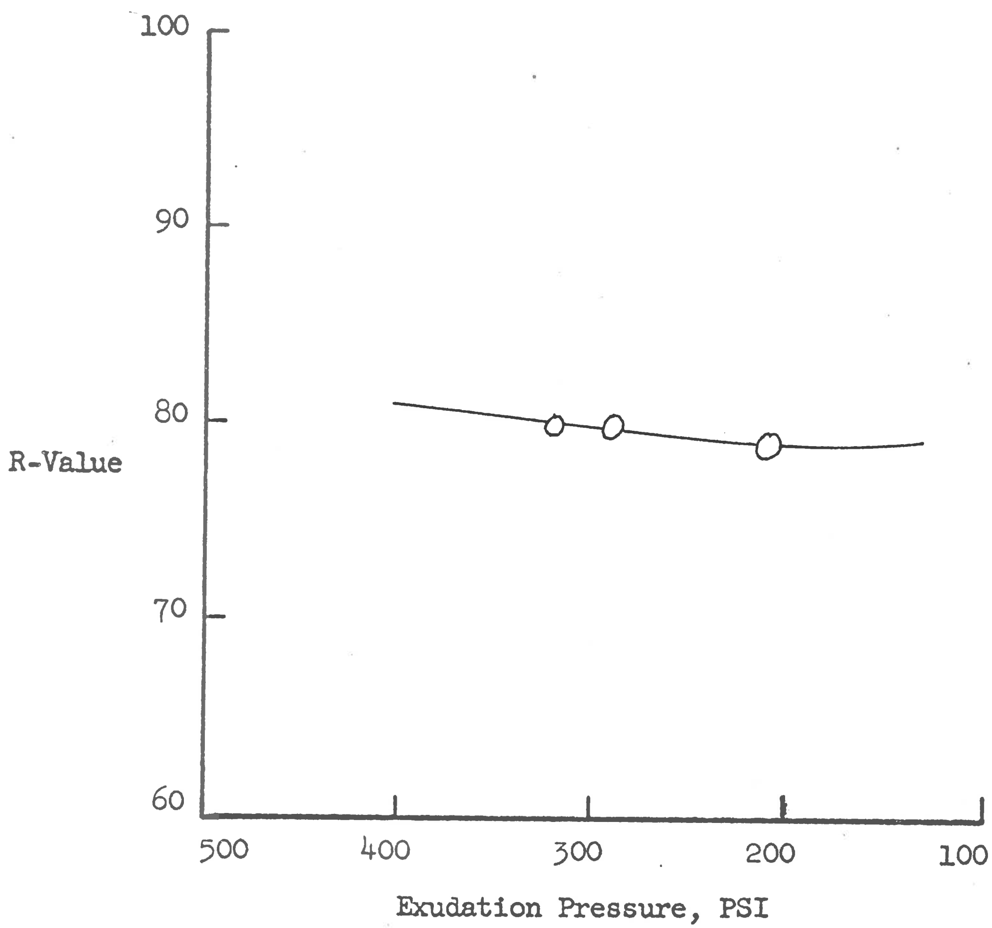
R-Value at 240 PSI: 81
R-Value at 300 PSI: 80



Summary of Data
California R-Value

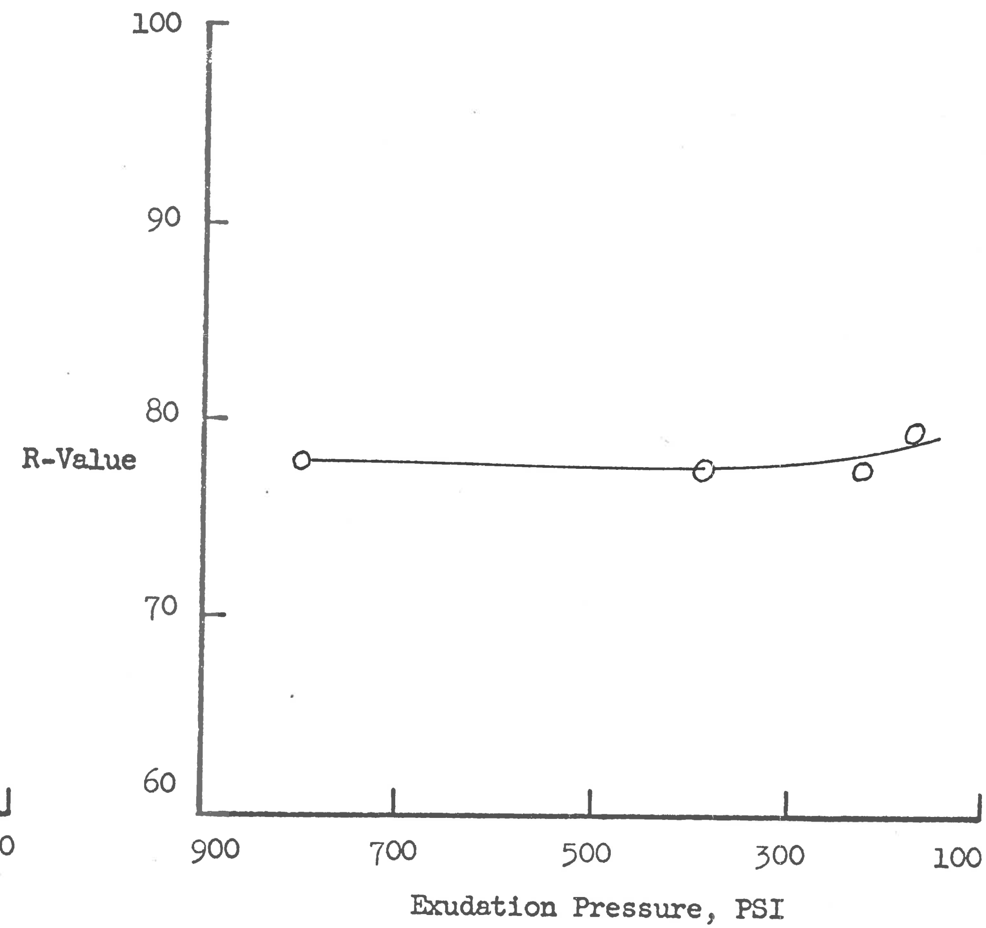
Sample No.: 273
Date Tested: 5-18-67
Visual Description: Tan Crushed Rock

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



Sample No.: 274
Date Tested: 5-18-67
Visual Description: Tan Crushed Rock

R-Value at 240 PSI: 78
R-Value at 300 PSI: 78



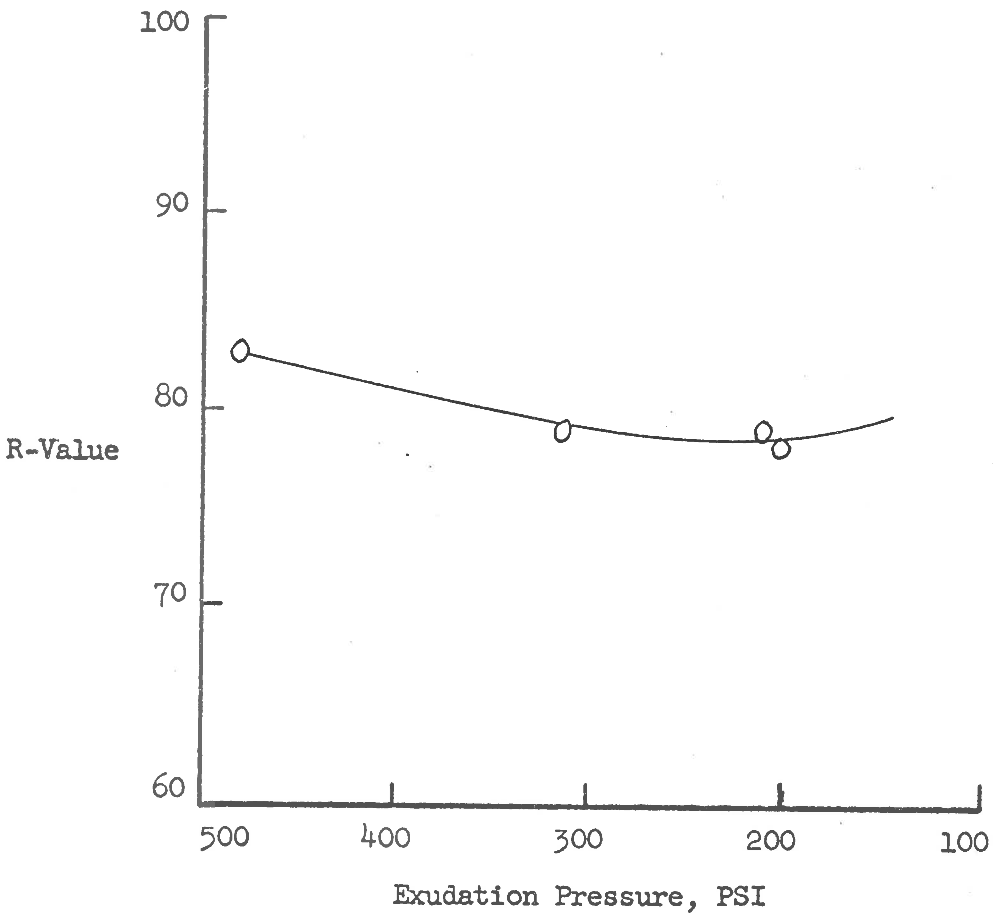
Summary of Data
California R-Value

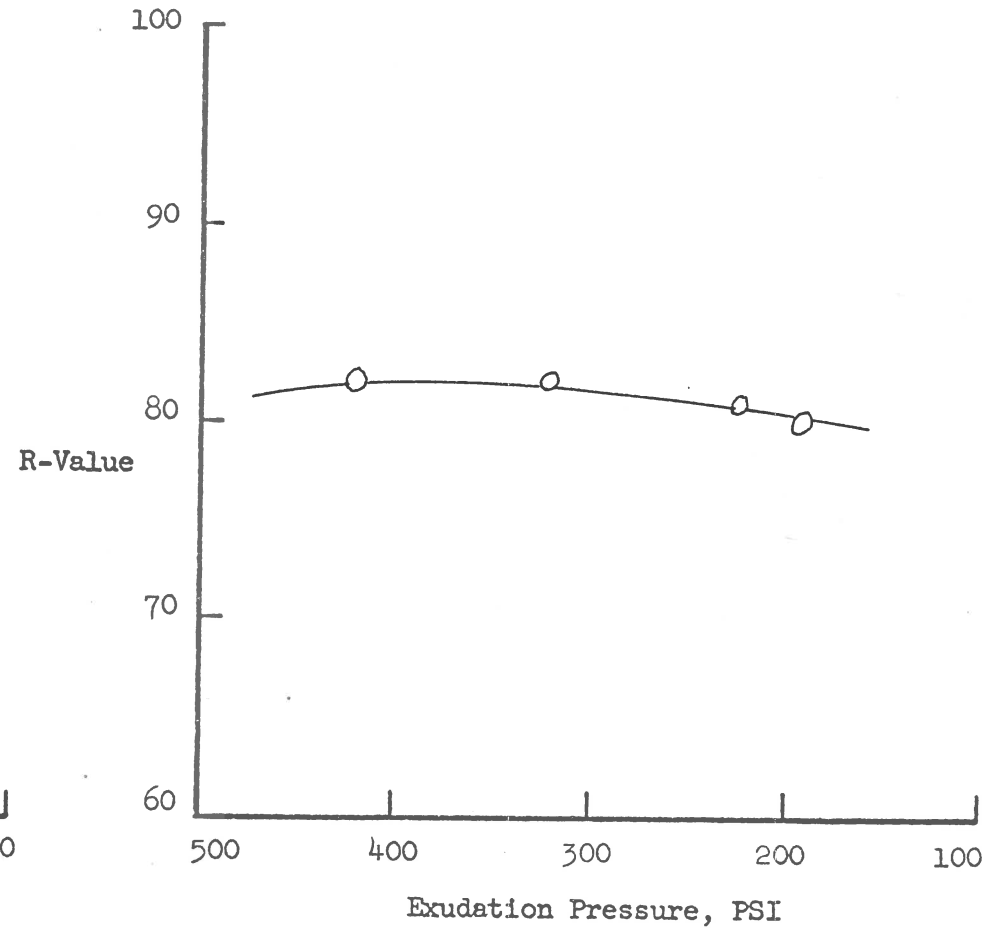
Sample No.: 275
Date Tested: 5-18-65
Visual Description: Tan Crushed Rock

R-Value at 240 PSI: 79
R-Value at 300 PSI: 80

Sample No.: 276
Date Tested: 5-18-67
Visual Description: Silty Sand with Gravel

R-Value at 240 PSI: 81
R-Value at 300 PSI: 82

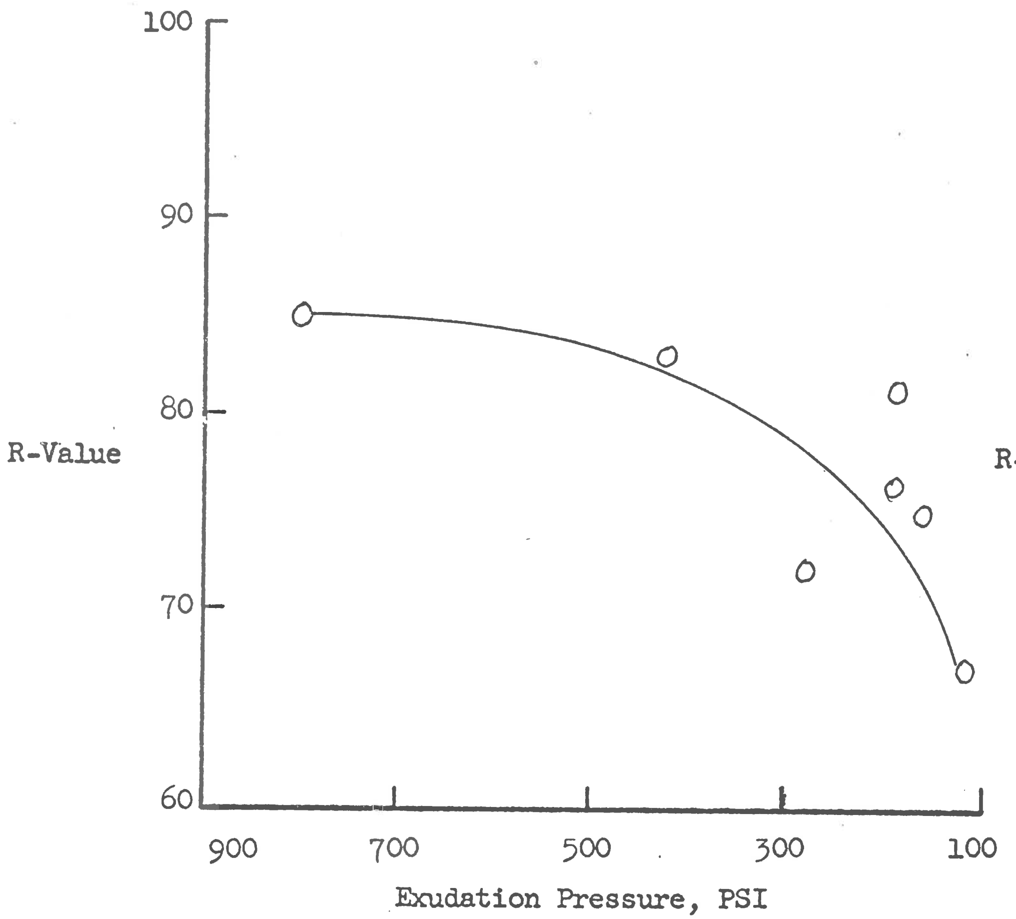




Summary of Data
California R-Value

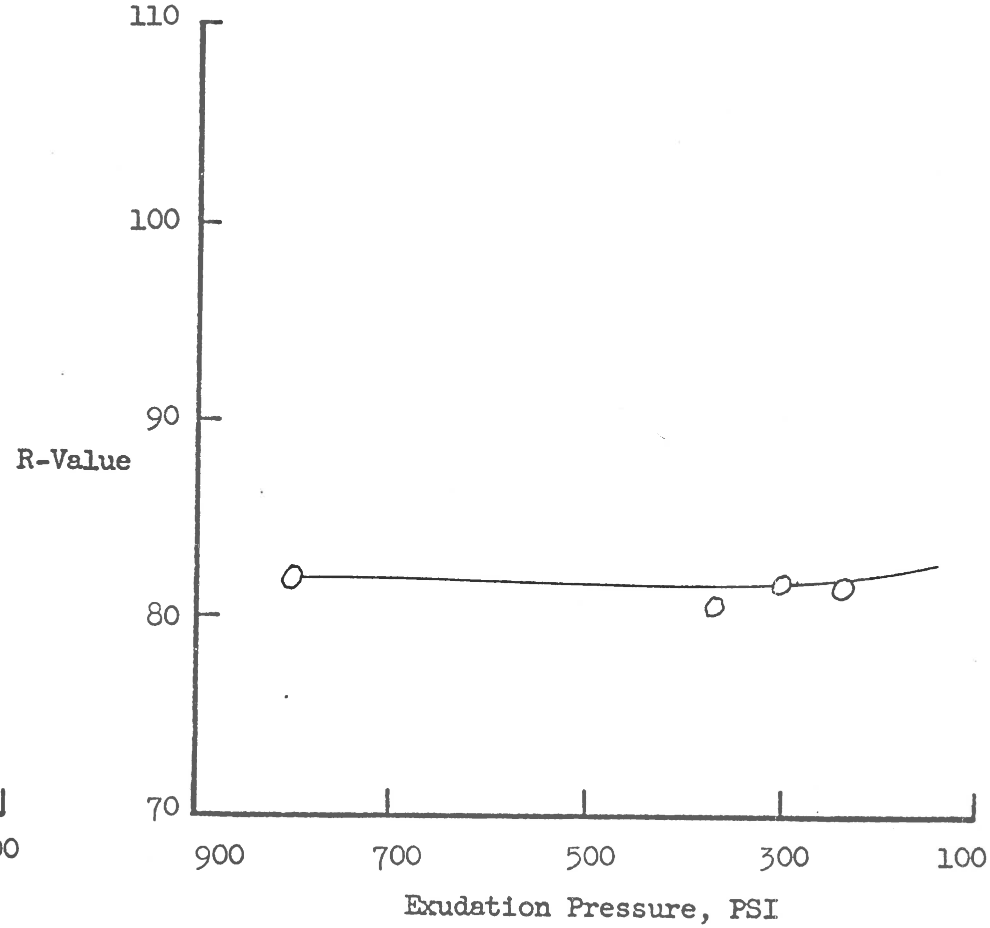
Sample No.: 277
Date Tested: 5-18-67
Visual Description: Brown Silty Sand

R-Value at 240 PSI: 77
R-Value at 300 PSI: 79



Sample No.: 278
Date Tested: 5-18-67
Visual Description: Brown Silty Sand

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



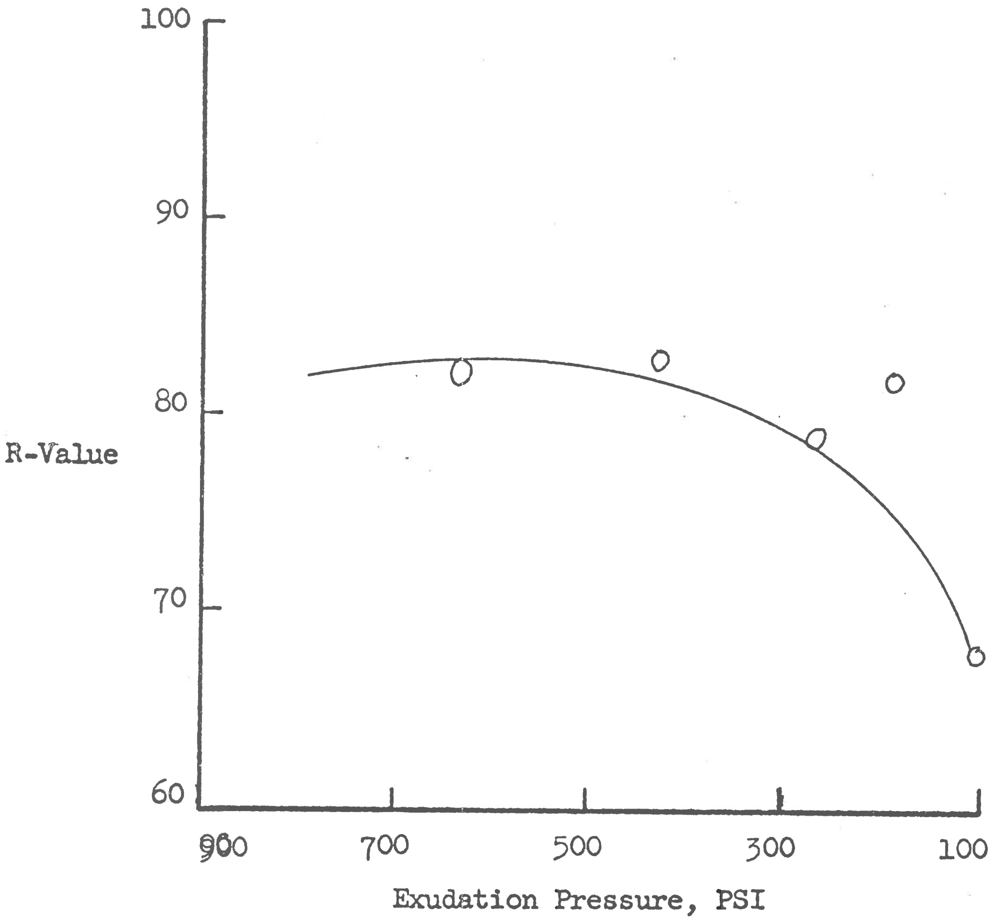
Summary of Data
California R-Value

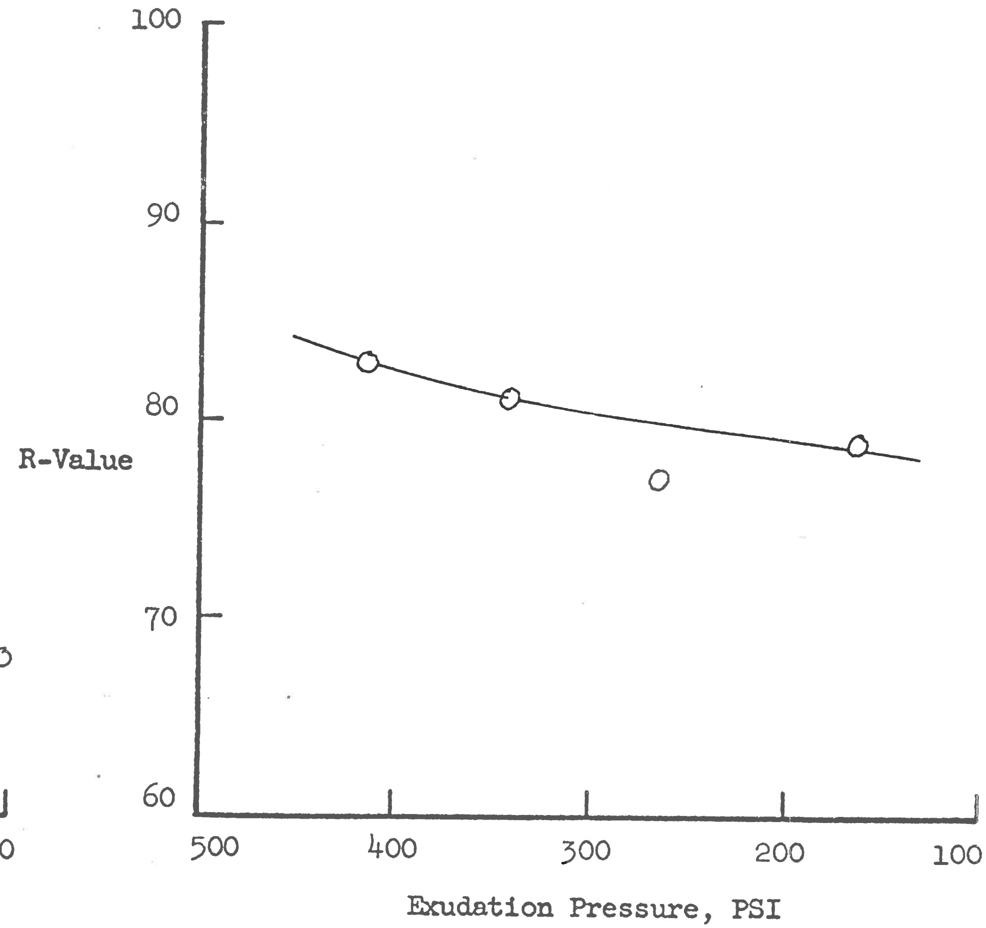
Sample No.: 279
Date Tested: 5-18-67
Visual Description: Brown Silty Sand

R-Value at 240 PSI: 78
R-Value at 300 PSI: 80

Sample No.: 280
Date Tested: 5-17-67
Visual Description: Tan Silt with Gravel

R-Value at 240 PSI: 80
R-Value at 300 PSI: 81

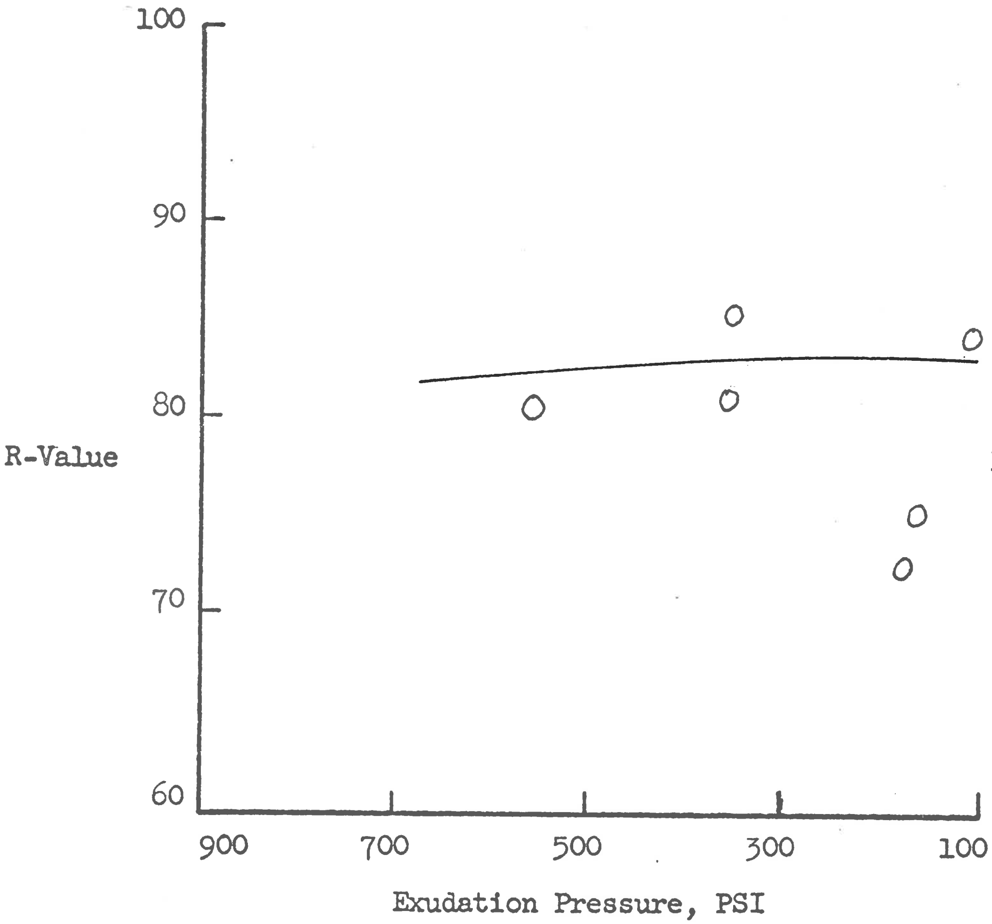




Summary of Data
California R-Value

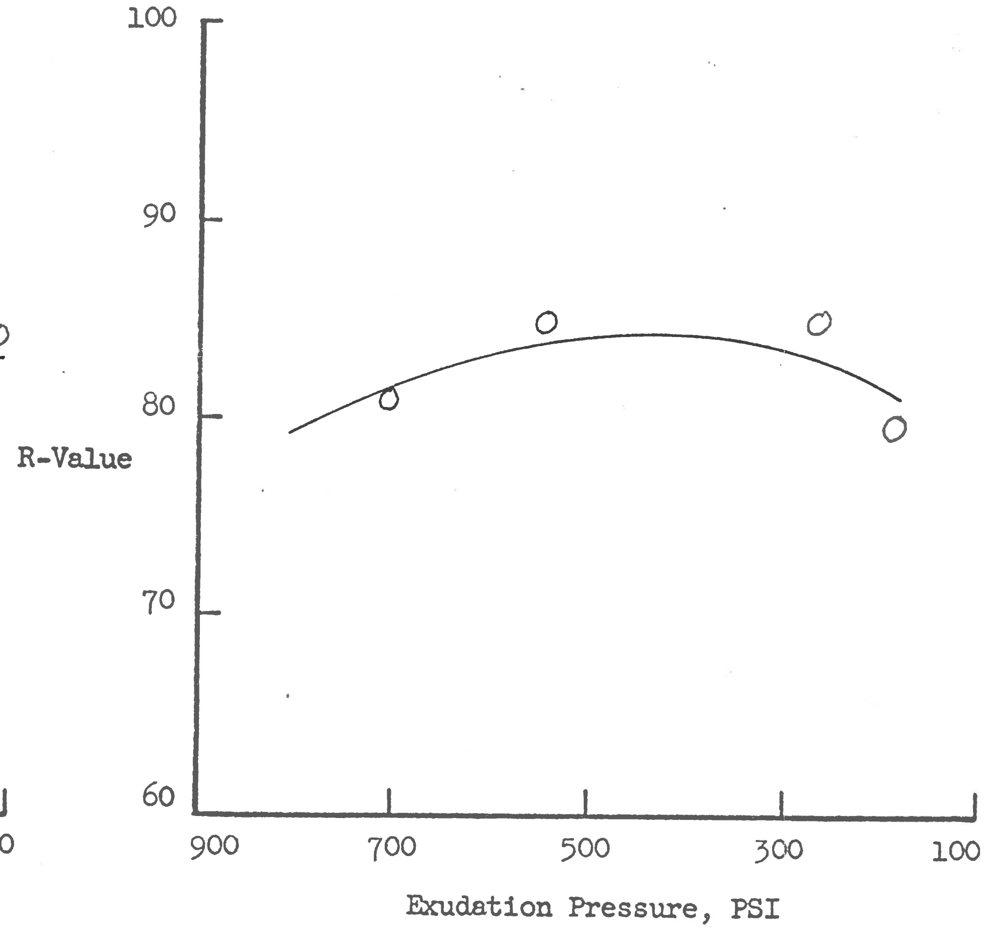
Sample No.: 281
Date Tested: 5-17-67
Visual Description: Gray Crushed Stone

R-Value at 240 PSI: 83
R-Value at 300 PSI: 83



Sample No.: 283
Date Tested: 5-17-67
Visual Description: Gray Crushed Stone

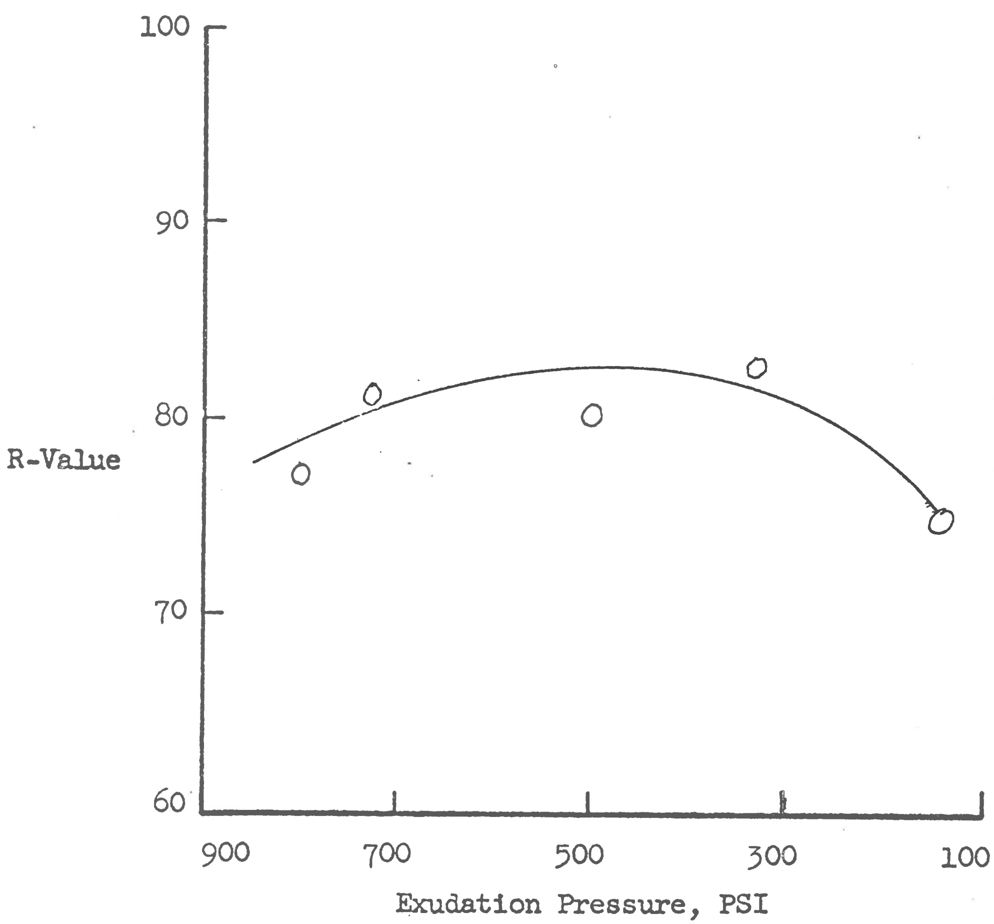
R-Value at 240 PSI: 83
R-Value at 300 PSI: 83



Summary of Data
California R-Value

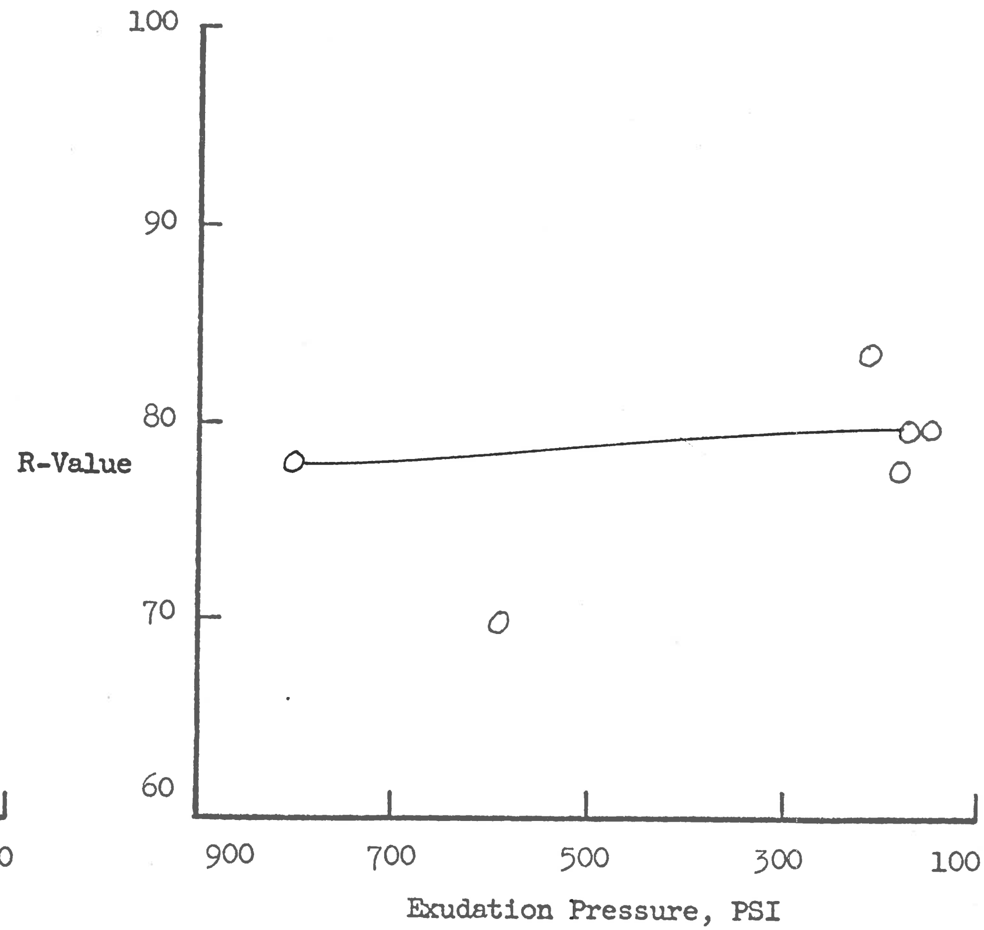
Sample No.: 284
Date Tested: 5-17-64
Visual Description: Gray Crushed Stone

R-Value at 240 PSI: 80
R-Value at 300 PSI: 81



Sample No.: 287
Date Tested: 5-17-67
Visual Description: Gray Crushed Stone

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



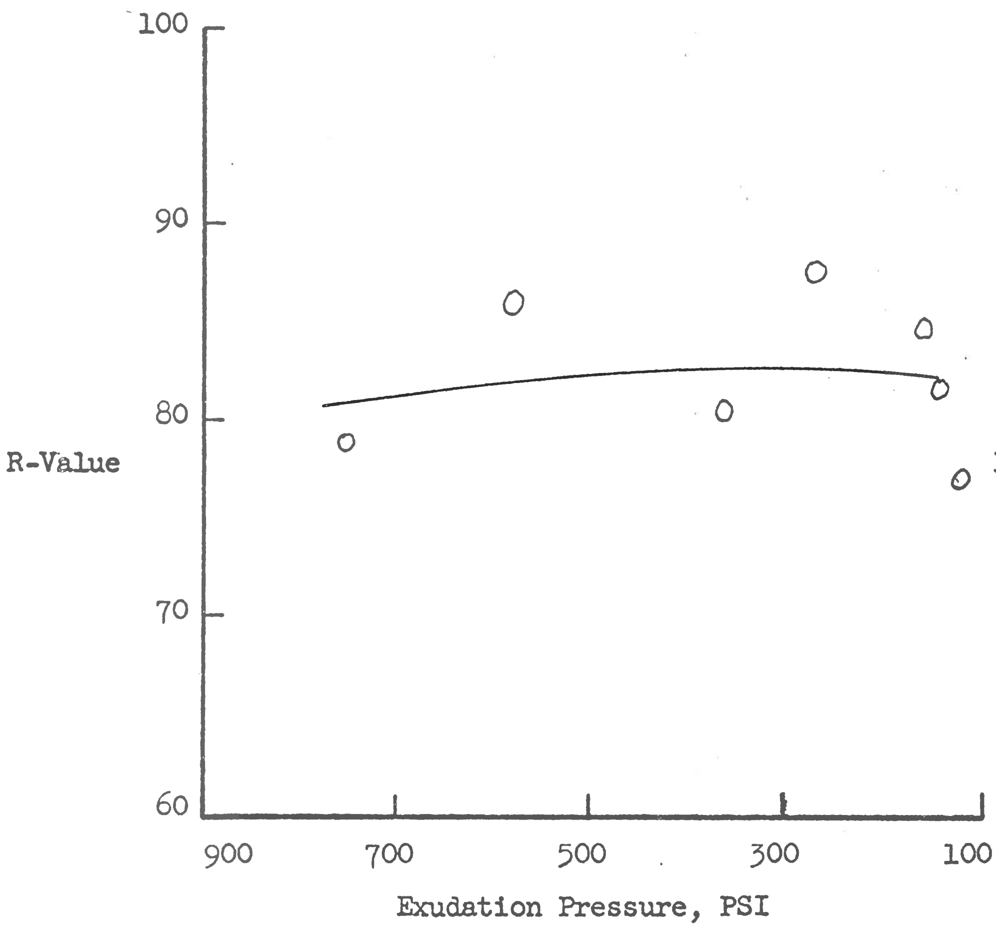
Summary of Data
California R-Value

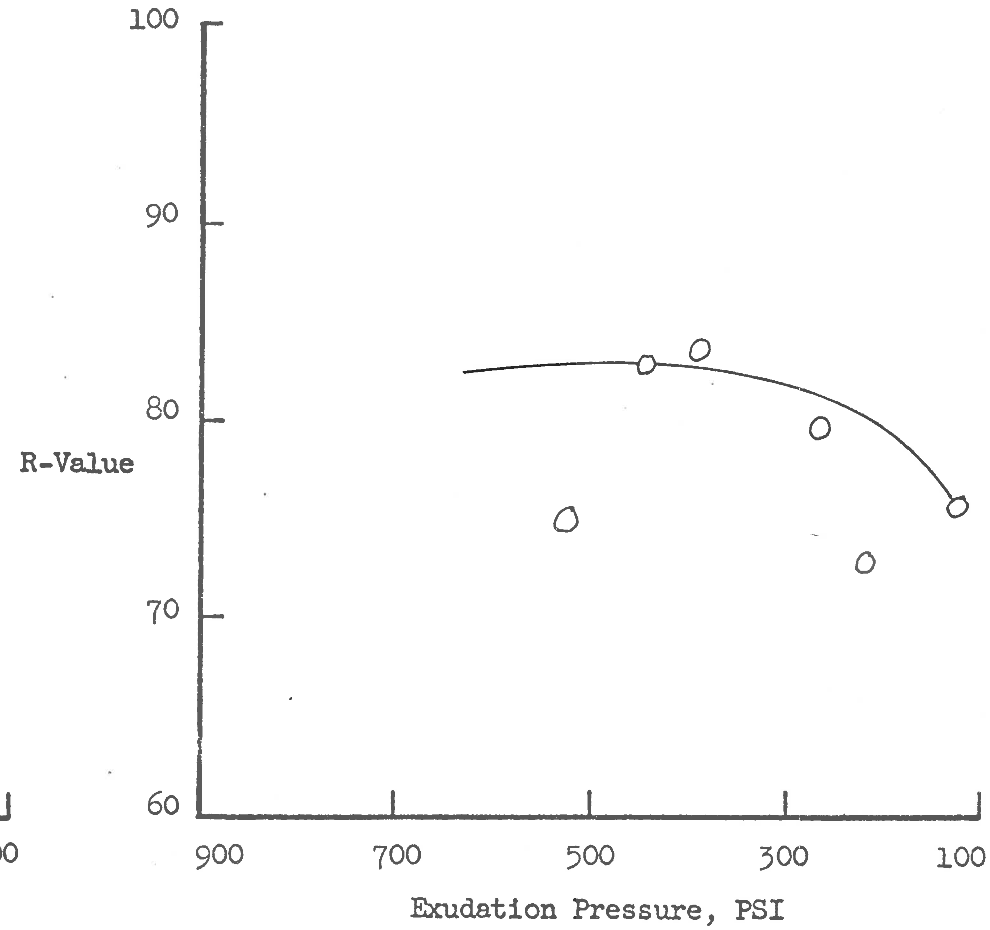
Sample No.: 290
Date Tested: 7-12-66
Visual Description: Gray Crushed Stone

R-Value at 240 PSI: 83
R-Value at 300 PSI: 83

Sample No.: 292
Date Tested: 5-9-66
Visual Description: Red Sandy Clay

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82

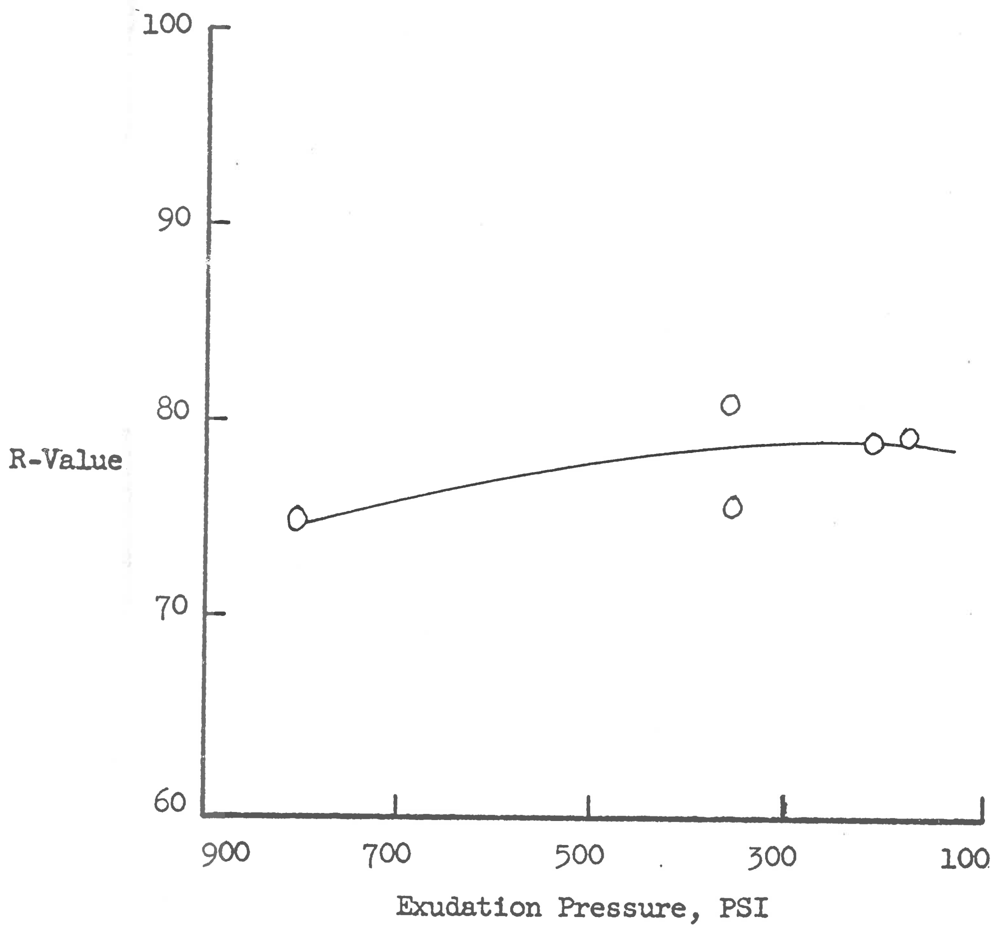




Summary of Data
California R-Value

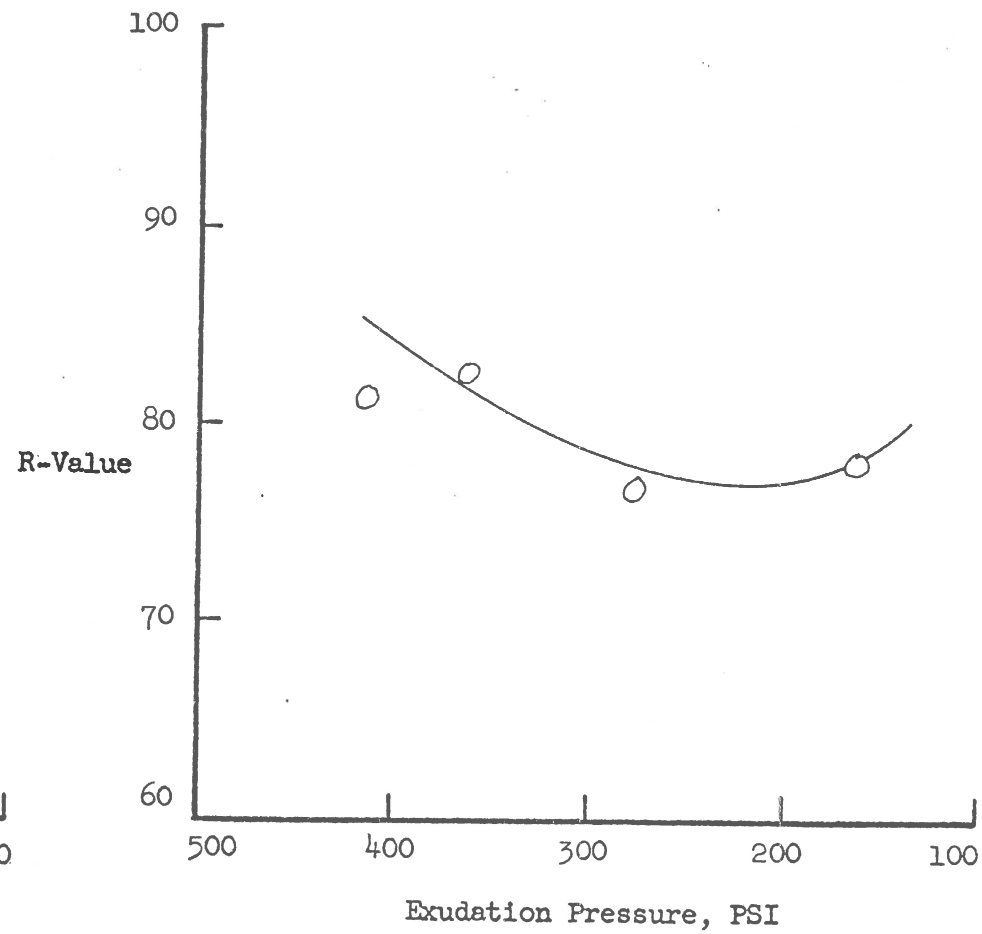
Sample No.: 298
Date Tested: 4-25-67
Visual Description: Sandy Clay with Gravel

R-Value at 240 PSI: 79
R-Value at 300 PSI: 78



Sample No.: 300
Date Tested: 4-25-66
Visual Description: Brown Sandy Clay

R-Value at 240 PSI: 78
R-Value at 300 PSI: 80



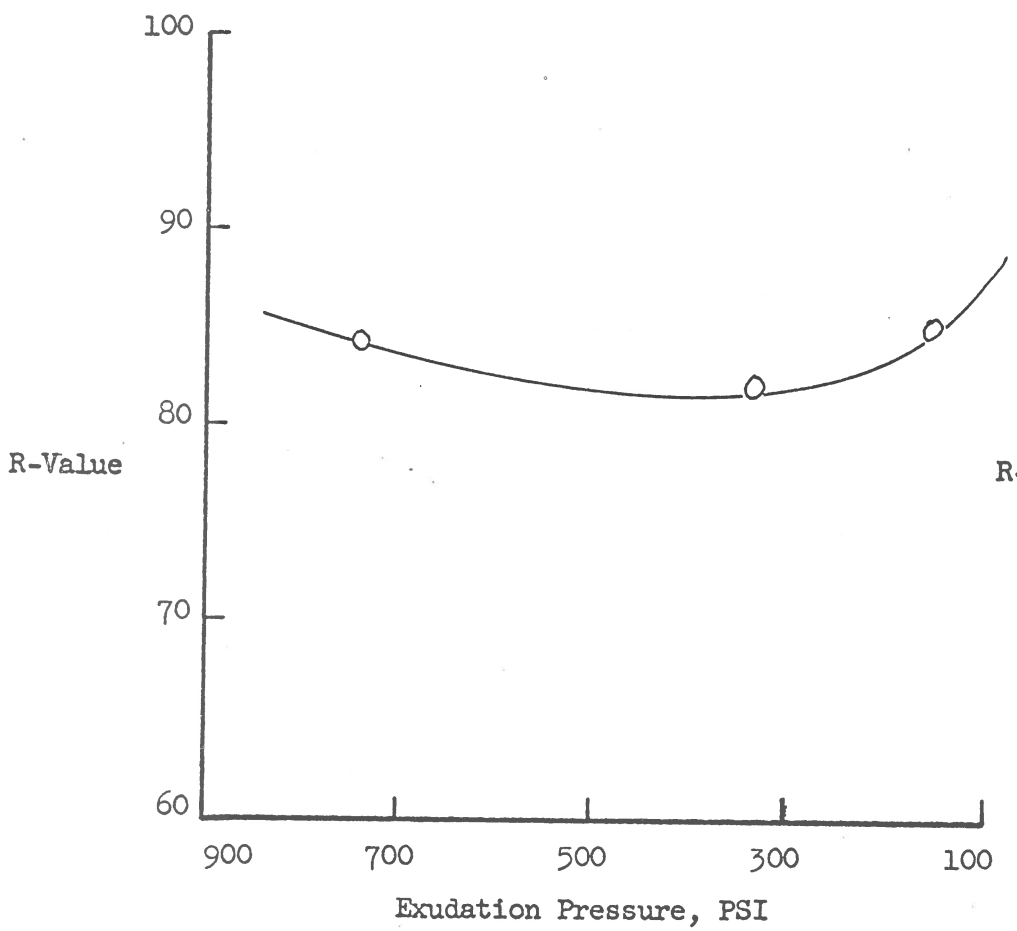
Summary of Data
California R-Value

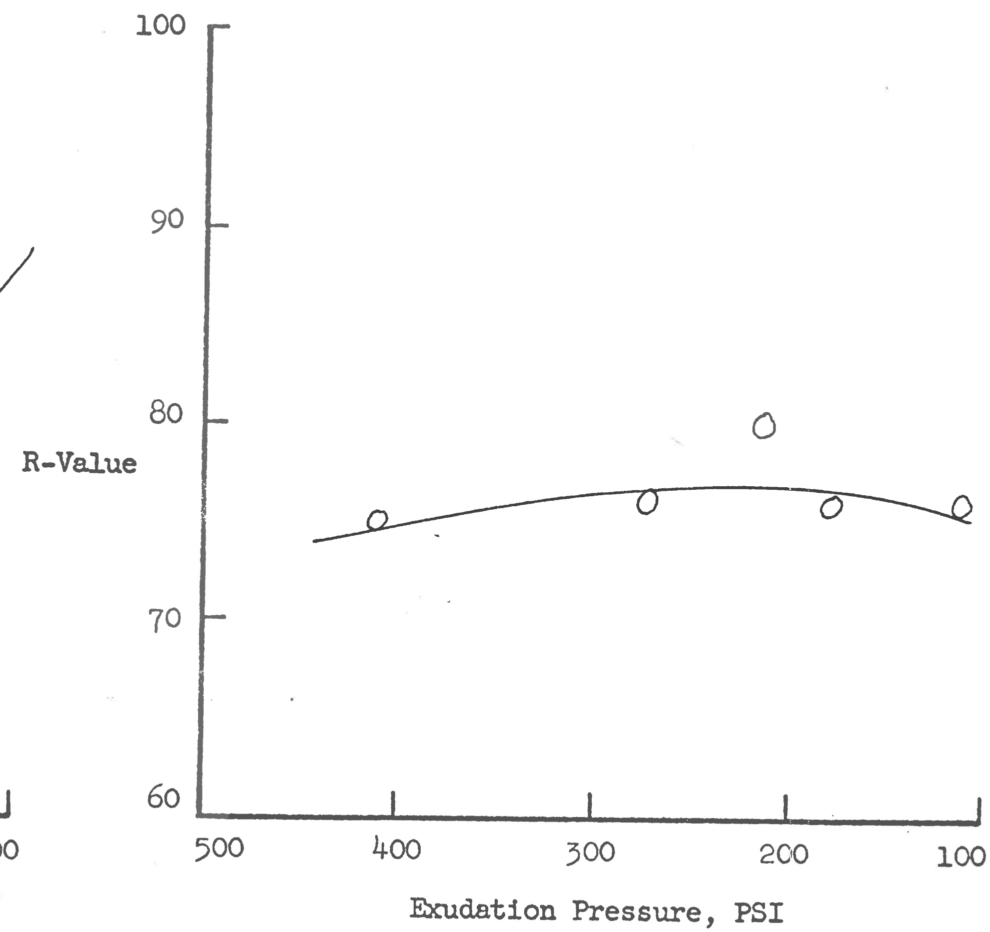
Sample No.: 294
Date Tested: 4-24-67
Visual Description: Brown Sandy Silt

R-Value at 240 PSI: 83
R-Value at 300 PSI: 83

Sample No.: 296
Date Tested: 4-24-66
Visual Description: Brown Sandy Clay

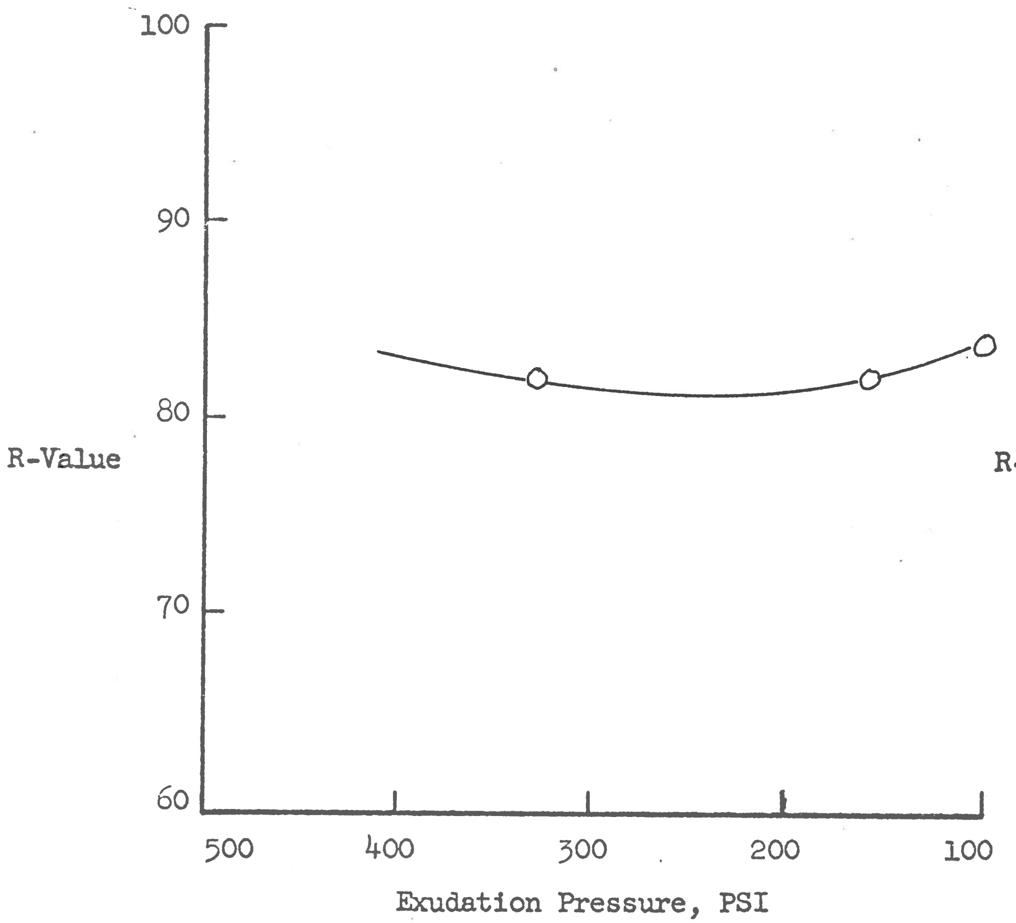
R-Value at 240 PSI: 76
R-Value at 300 PSI: 76

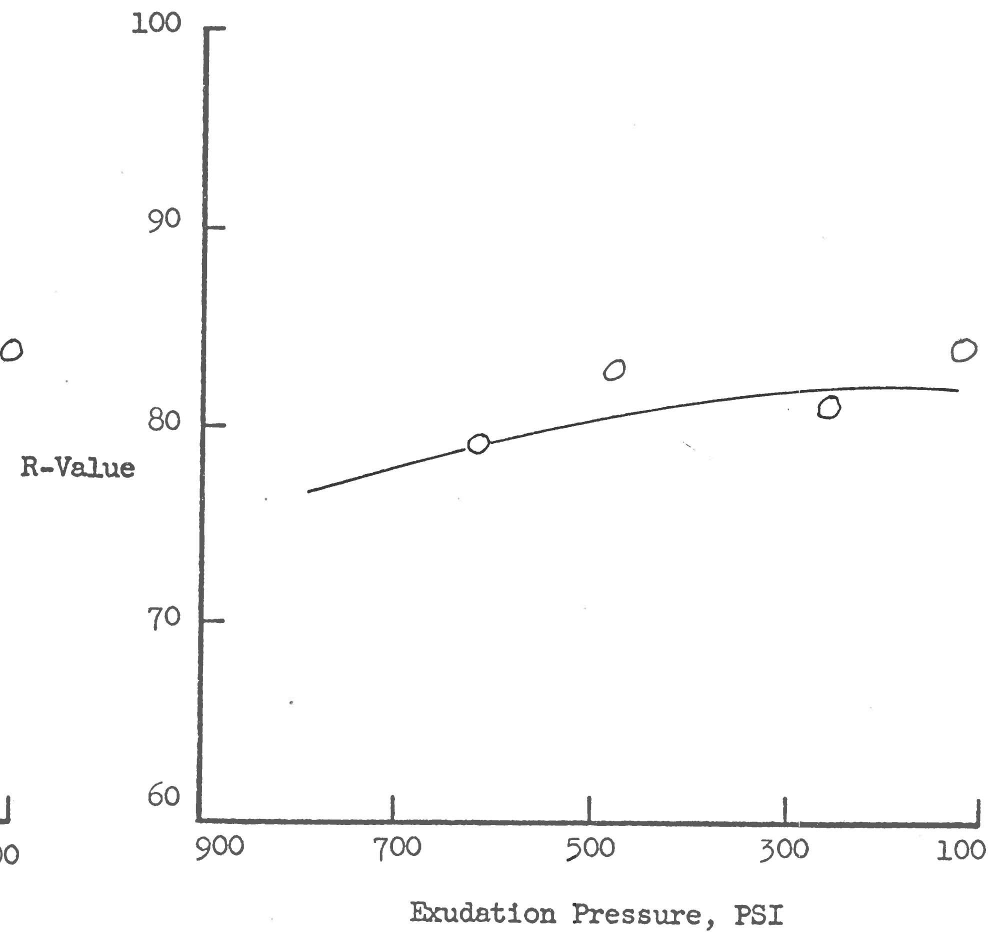




Summary of Data
California R-Value

Sample No.:	301	Sample No.:	303
Date Tested:	5-17-67	Date Tested:	5-17-67
Visual Description:	Gray Silt	Visual Description:	Gray Silt
R-Value at 240 PSI:	82	R-Value at 240 PSI:	81
R-Value at 300 PSI:	82	R-Value at 300 PSI:	81

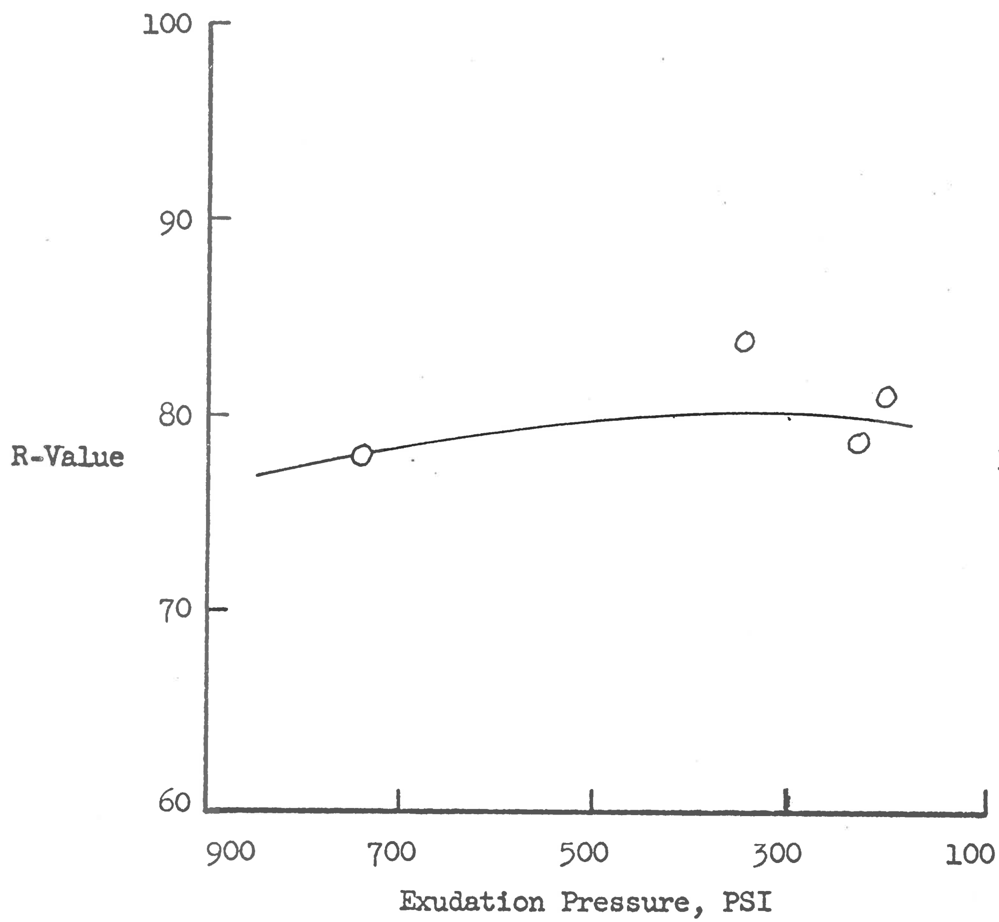




Summary of Data
California R-Value

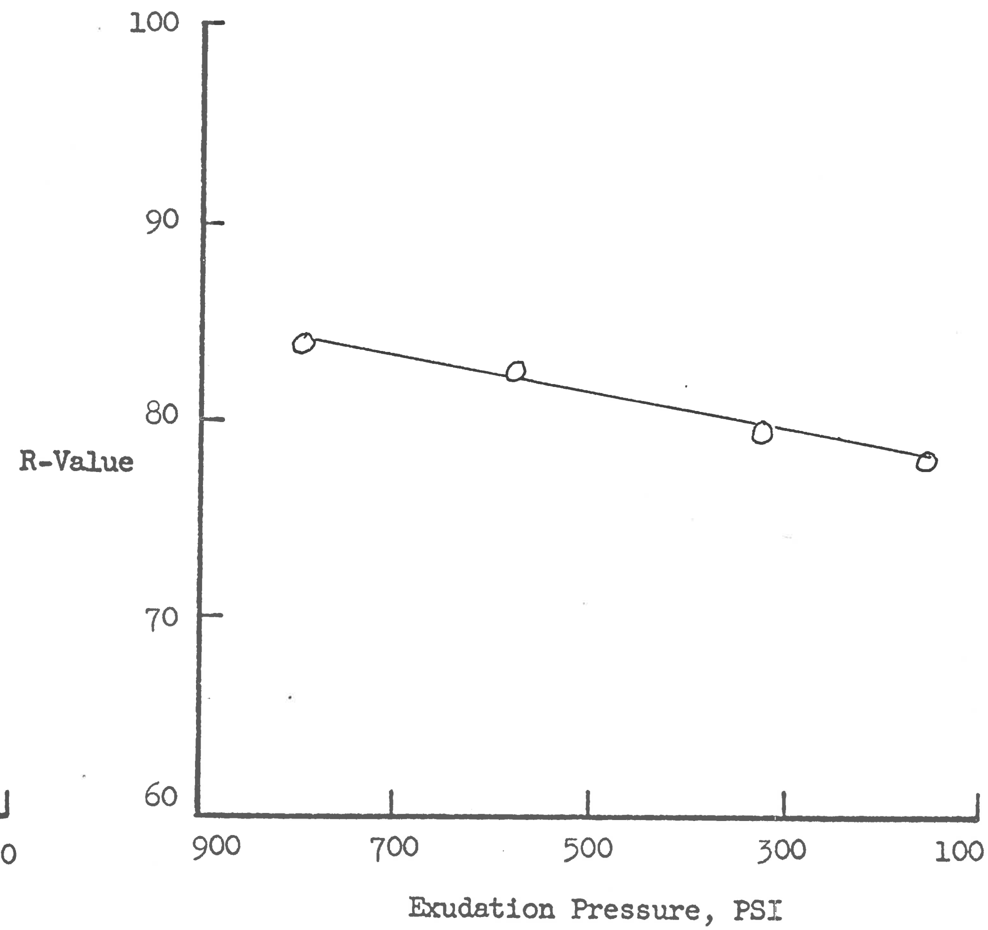
Sample No.: 305
Date Tested: 5-17-67
Visual Description: Gray Silt

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



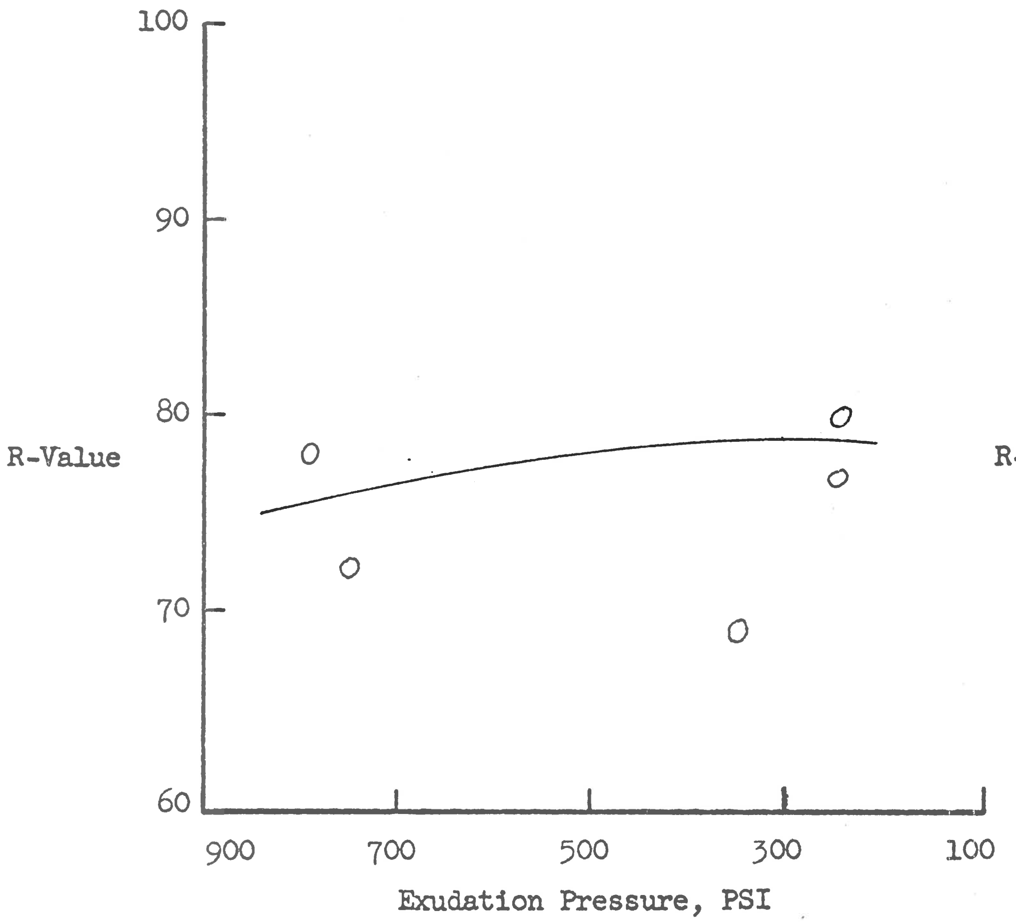
Sample No.: 307
Date Tested: 5-17-65
Visual Description: Gray Silt

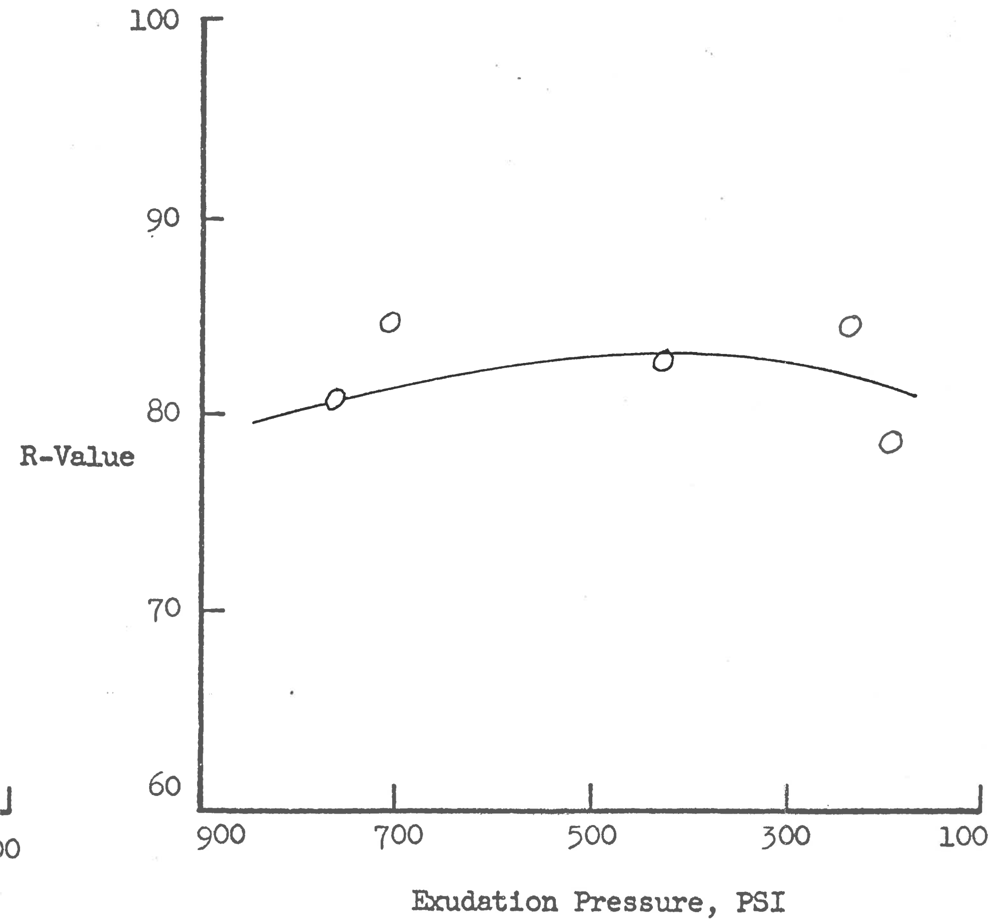
R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



Summary of Data
California R-Value

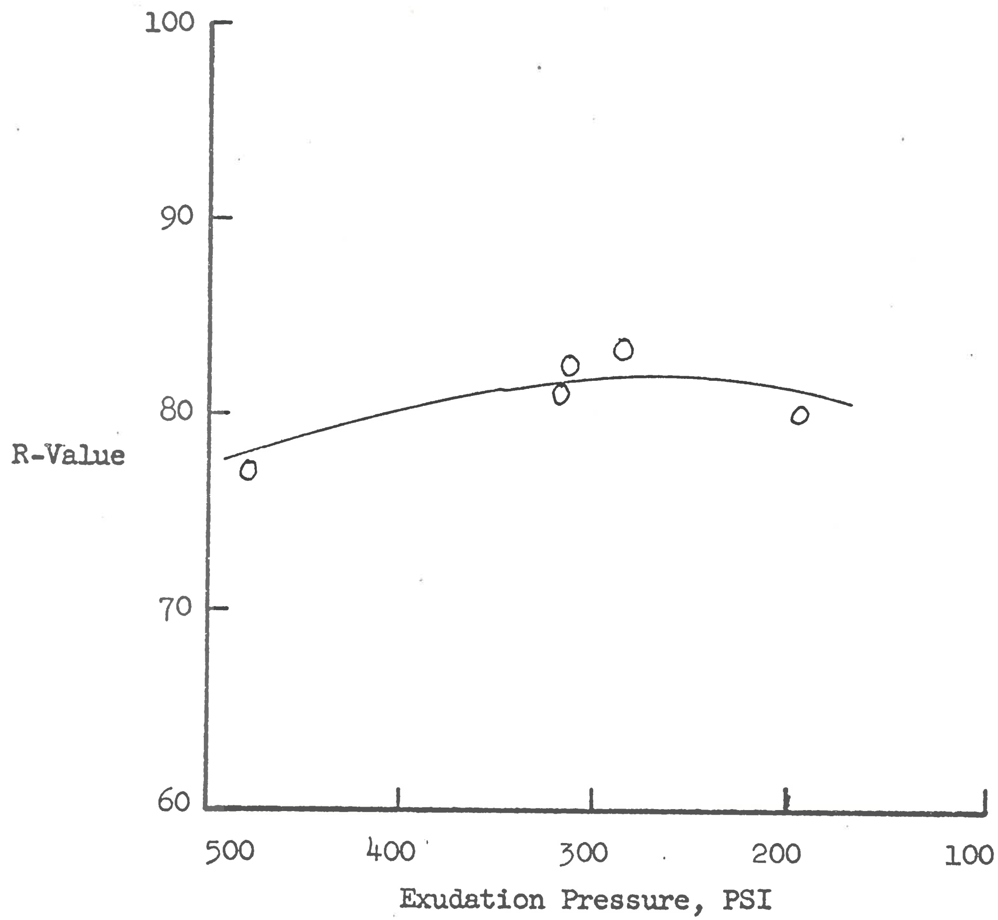
Sample No.:	309	Sample No.:	312
Date Tested:	5-17-67	Date Tested:	5-9-67
Visual Description:	Gray Silt	Visual Description:	Gray Silt
R-Value at 240 PSI:	79	R-Value at 240 PSI:	83
R-Value at 300 PSI:	79	R-Value at 300 PSI:	83

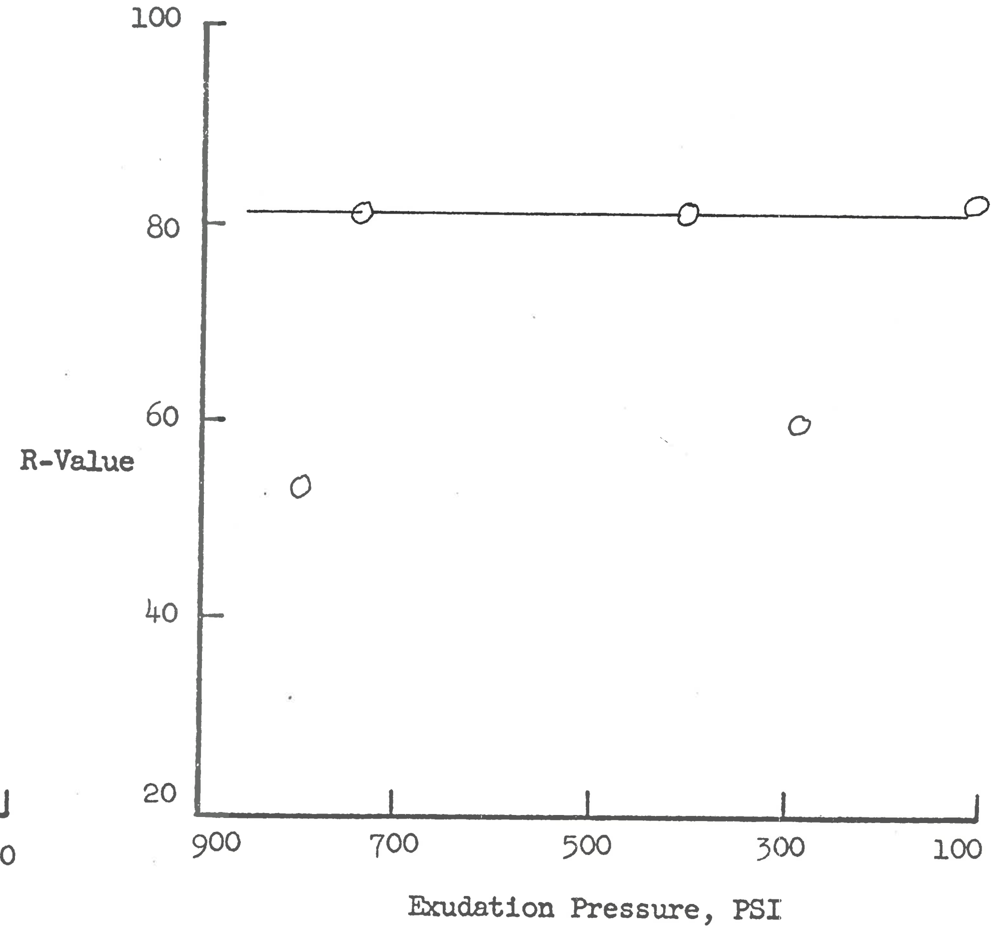




Summary of Data
California R-Value

Sample No.:	314	Sample No.:	316
Date Tested:	4-25-67	Date Tested:	4-25-67
Visual Description:	Gray Crushed Fines	Visual Description:	Crushed Rock Fines
R-Value at 240 PSI:	82	R-Value at 240 PSI:	81
R-Value at 300 PSI:	82	R-Value at 300 PSI:	81

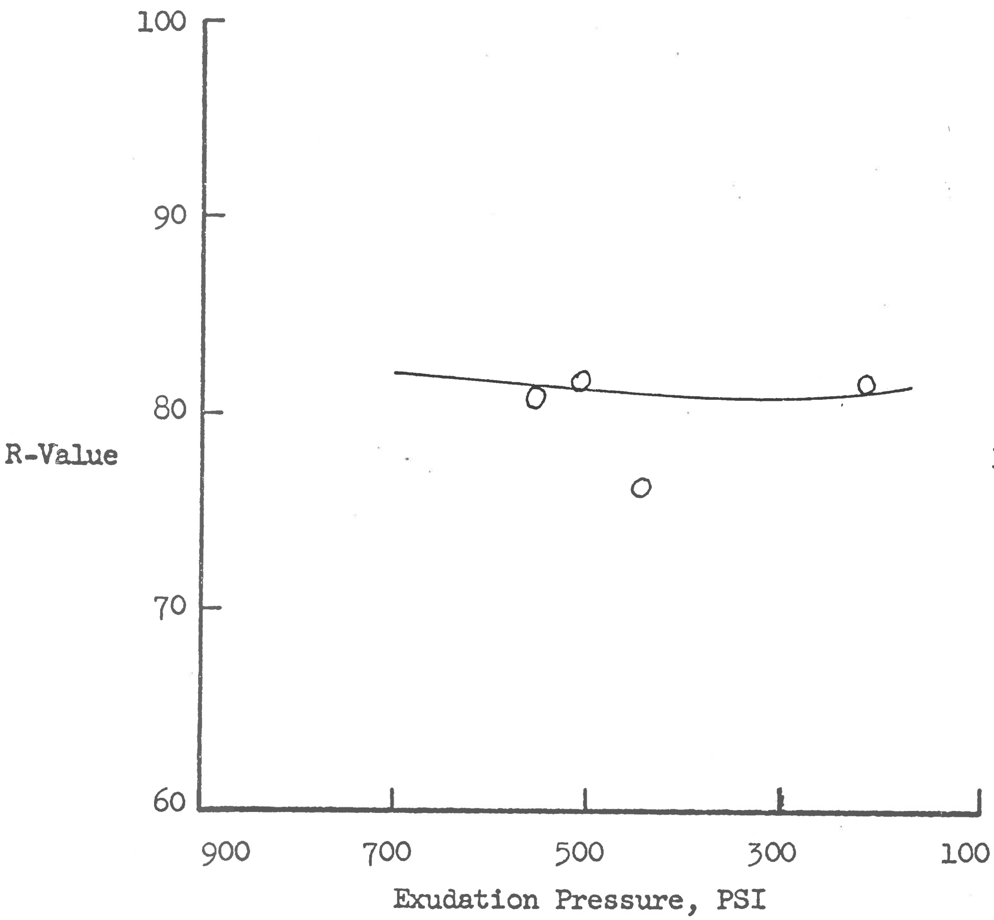




Summary of Data
California R-Value

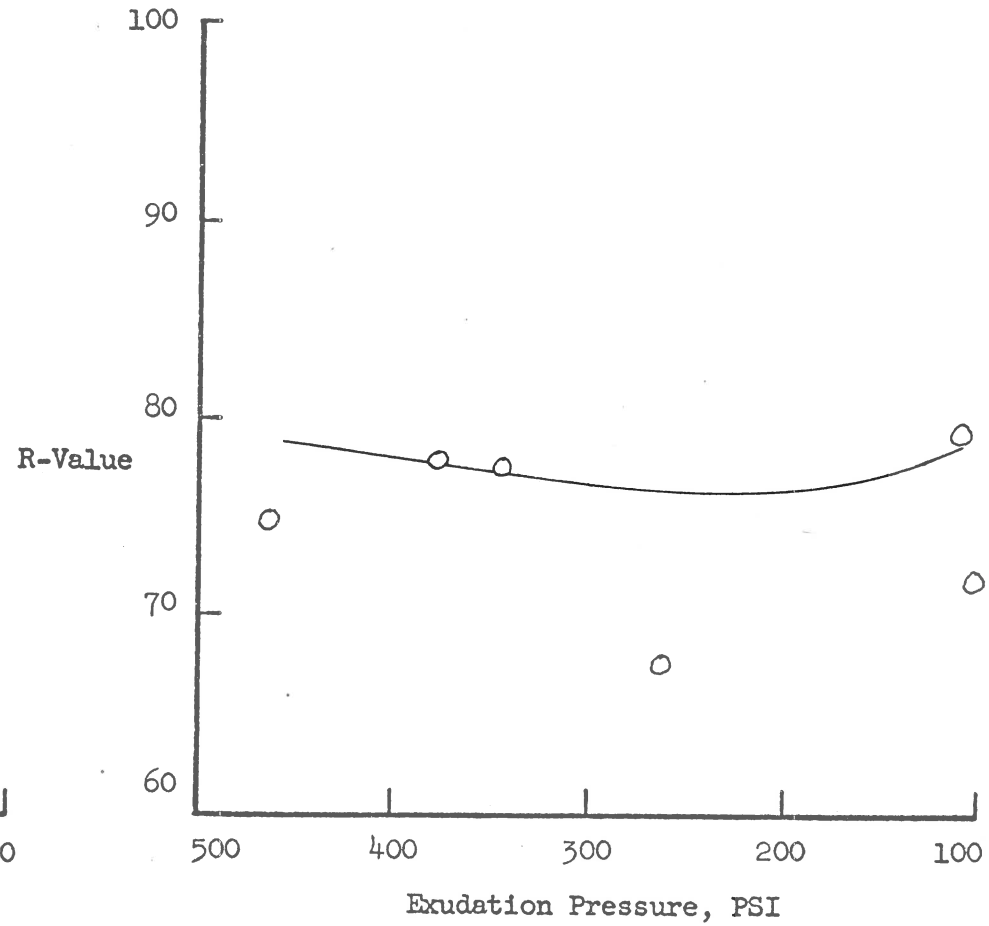
Sample No.: 318
Date Tested: 4-25-67
Visual Description: Crushed Rock Fines

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



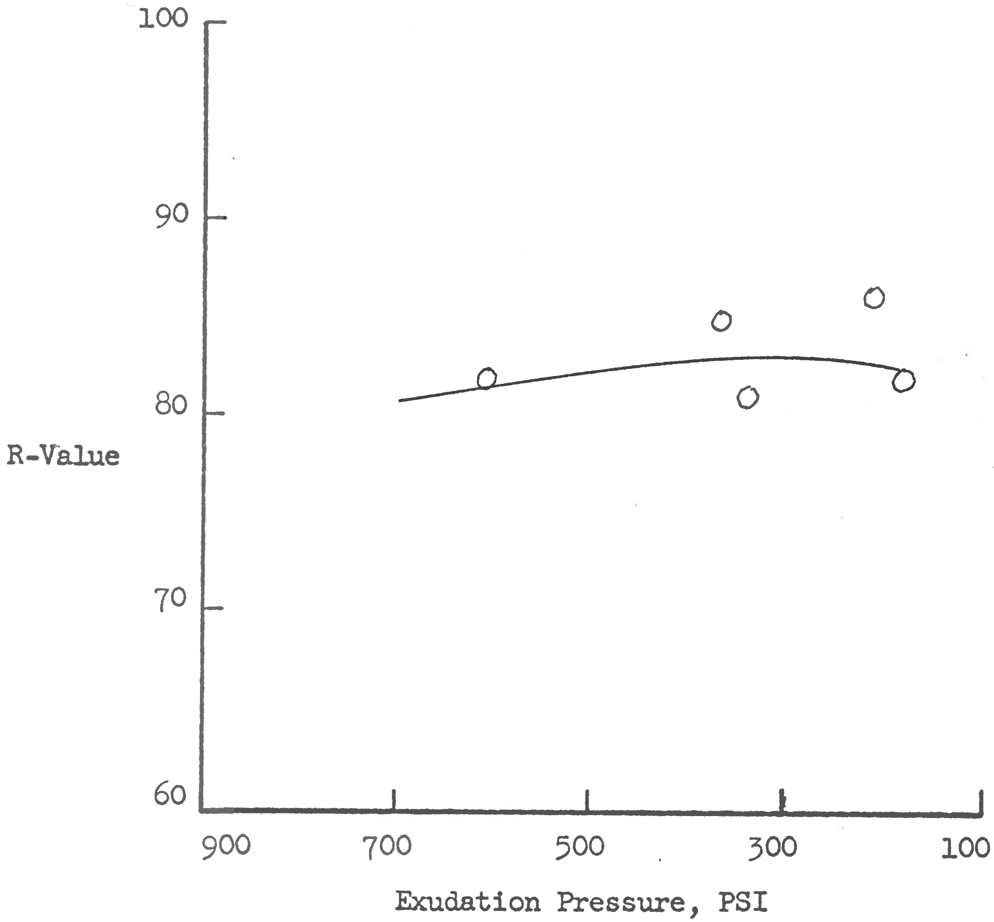
Sample No.: 320
Date Tested: 5-9-67
Visual Description: Crushed Rock Fines

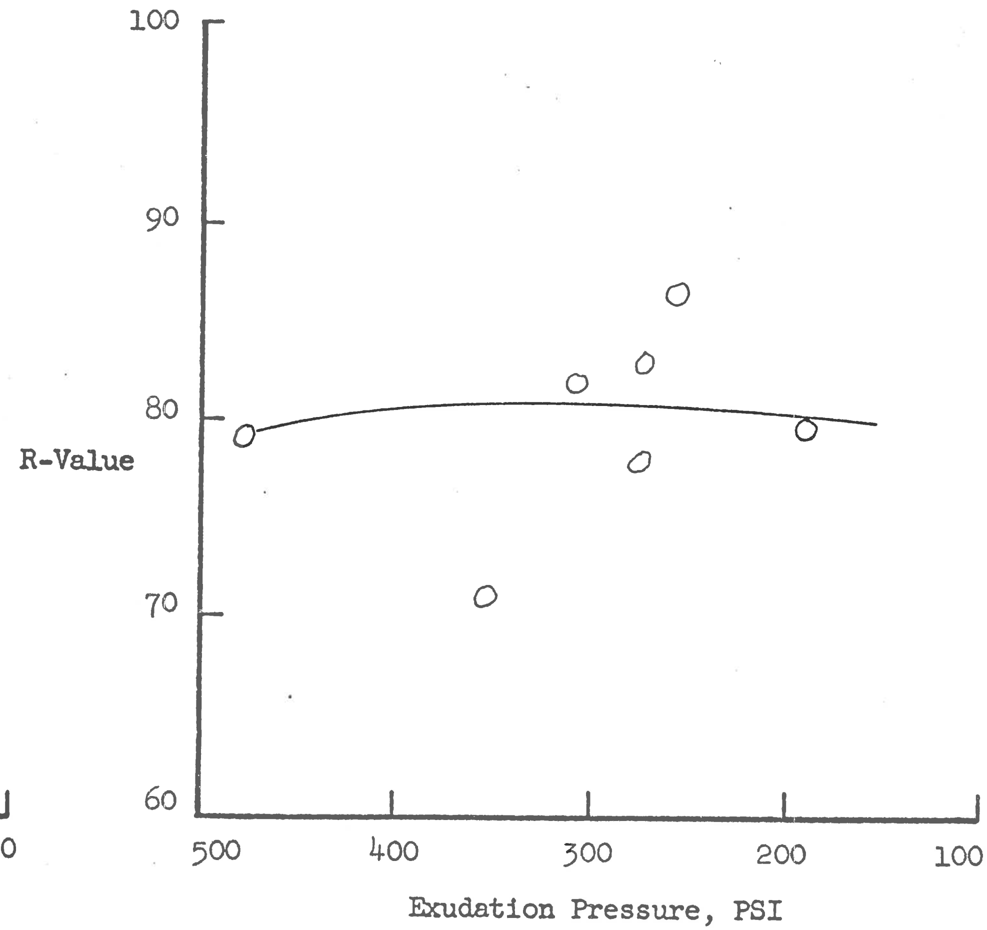
R-Value at 240 PSI: 77
R-Value at 300 PSI: 77



Summary of Data
California R-Value

Sample No.:	322	Sample No.:	324
Date Tested:	5-9-67	Date Tested:	9-5-67
Visual Description:	Tan Sandy Silt	Visual Description:	Tan Sandy Silt
R-Value at 240 PSI:	83	R-Value at 240 PSI:	81
R-Value at 300 PSI:	83	R-Value at 300 PSI:	81

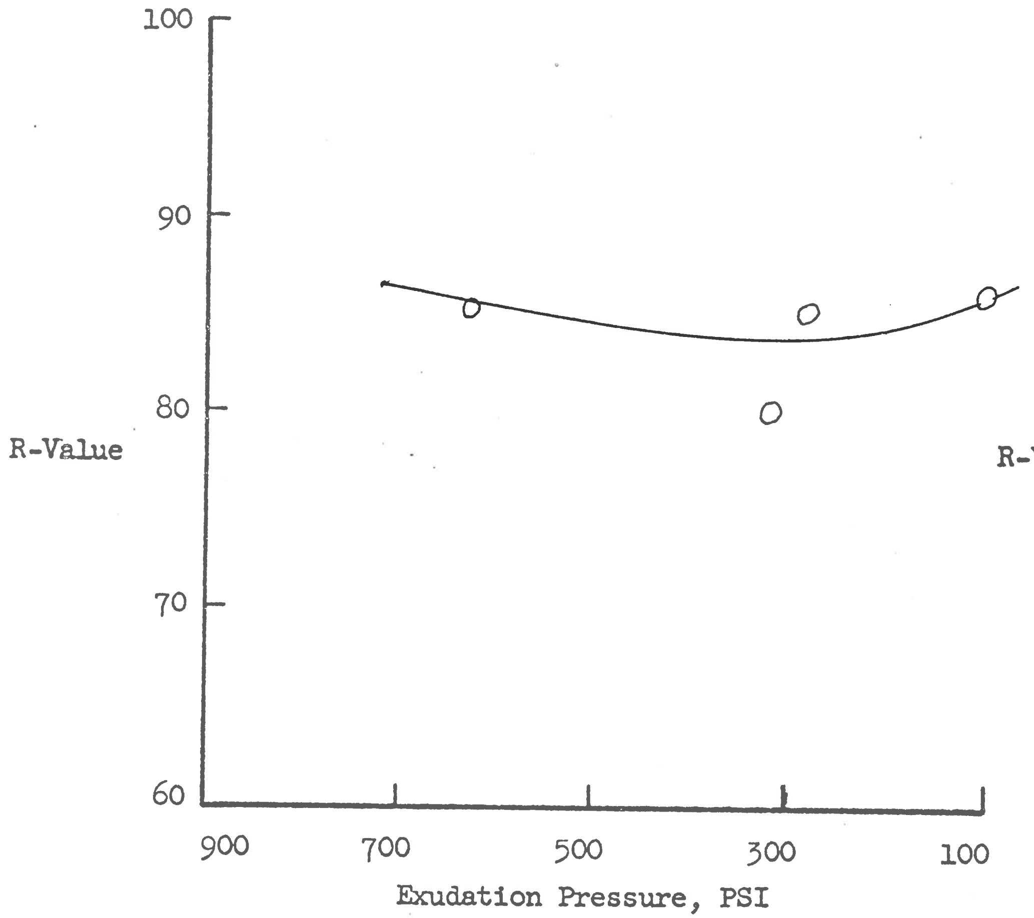


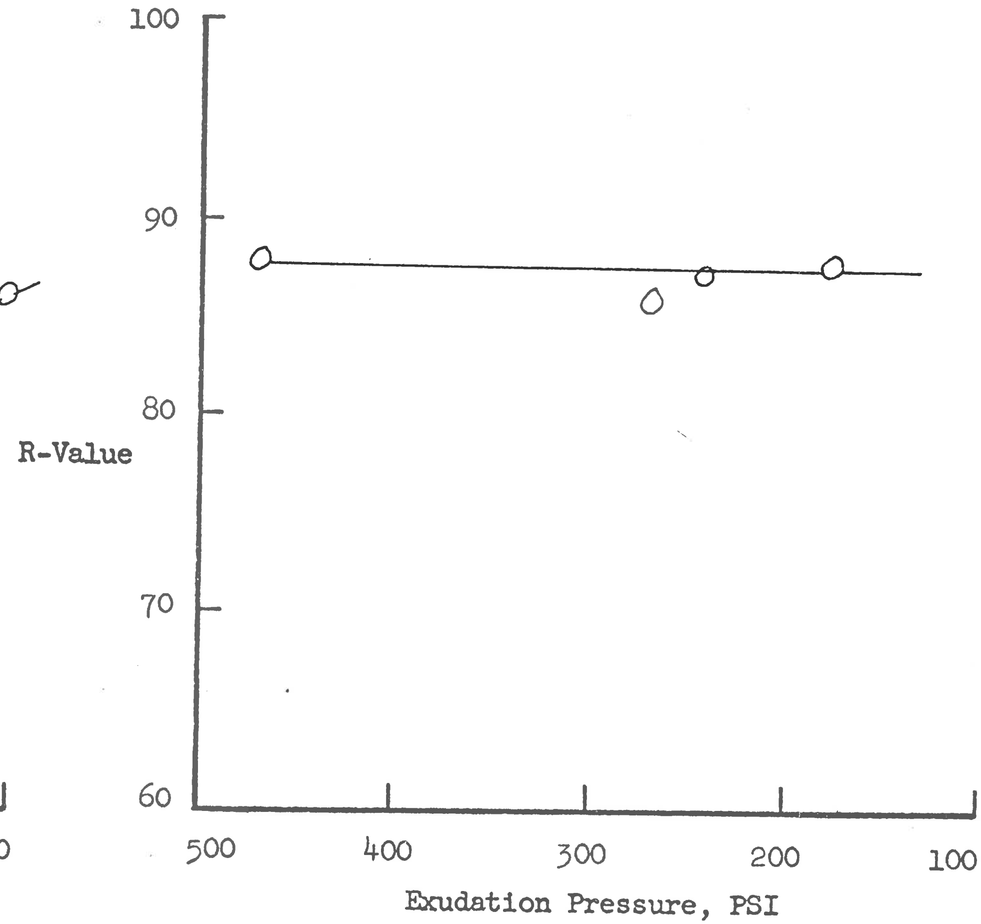


Summary of Data
California R-Value

Sample No.:	326
Date Tested:	5-9-67
Visual Description:	Tan Sandy Silt
R-Value at 240 PSI:	84
R-Value at 300 PSI:	84

Sample No.:	328
Date Tested:	9-5-67
Visual Description:	Tan Sandy Silt
R-Value at 240 PSI:	87
R-Value at 300 PSI:	87





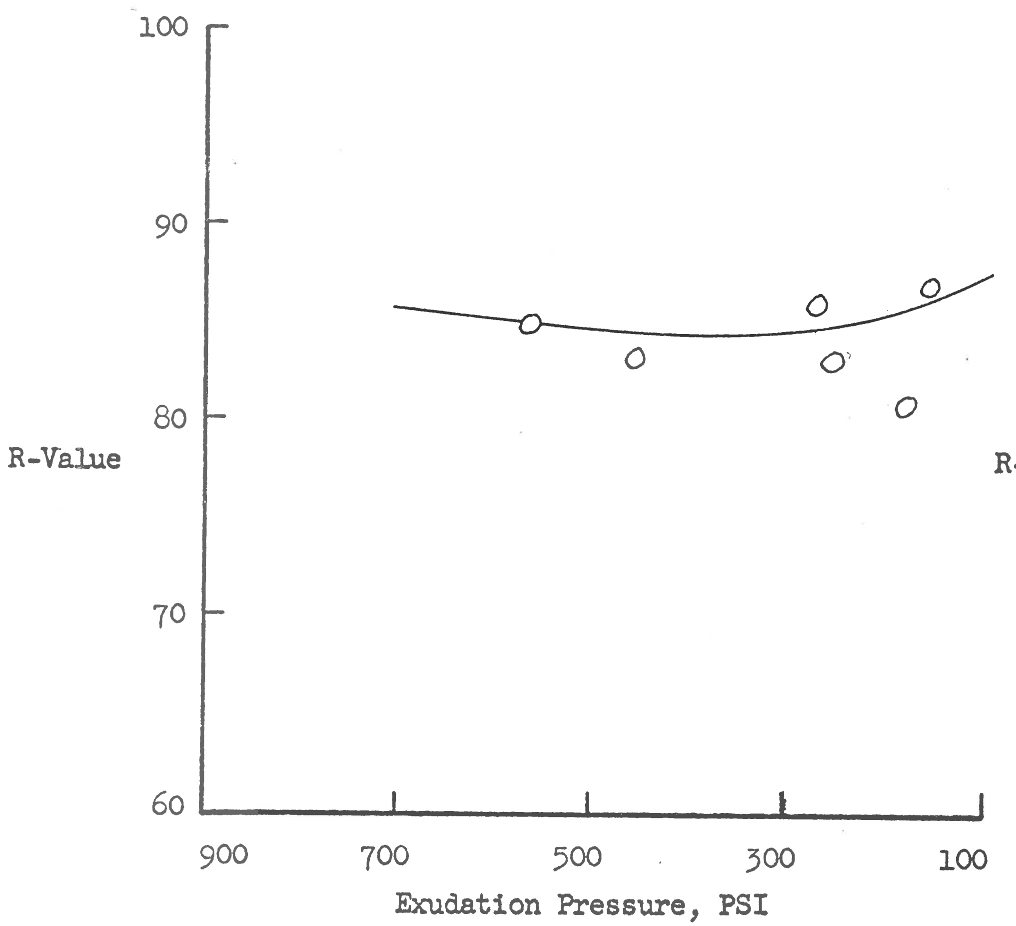
Summary of Data
California R-Value

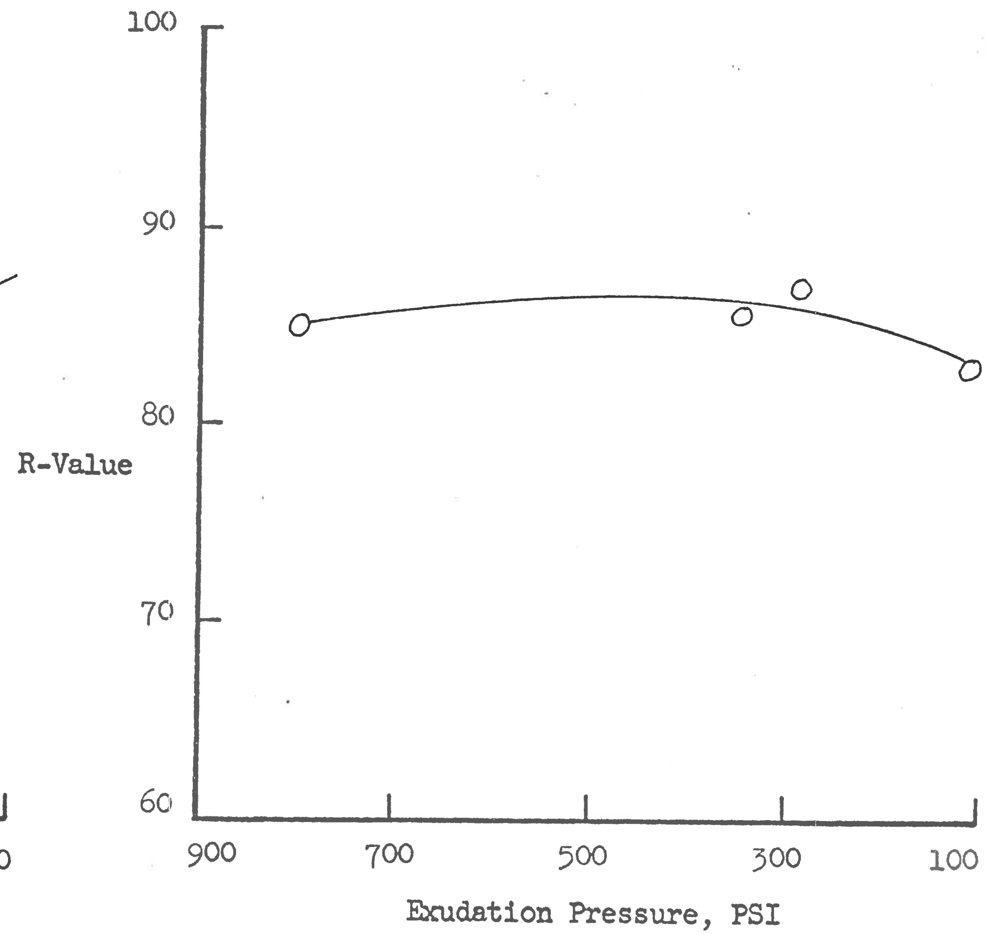
Sample No.: 330
Date Tested: 5-9-67
Visual Description: Tan Sandy Silt

R-Value at 240 PSI: 85
R-Value at 300 PSI: 85

Sample No.: 332
Date Tested: 5-9-67
Visual Description: White Rock Fines

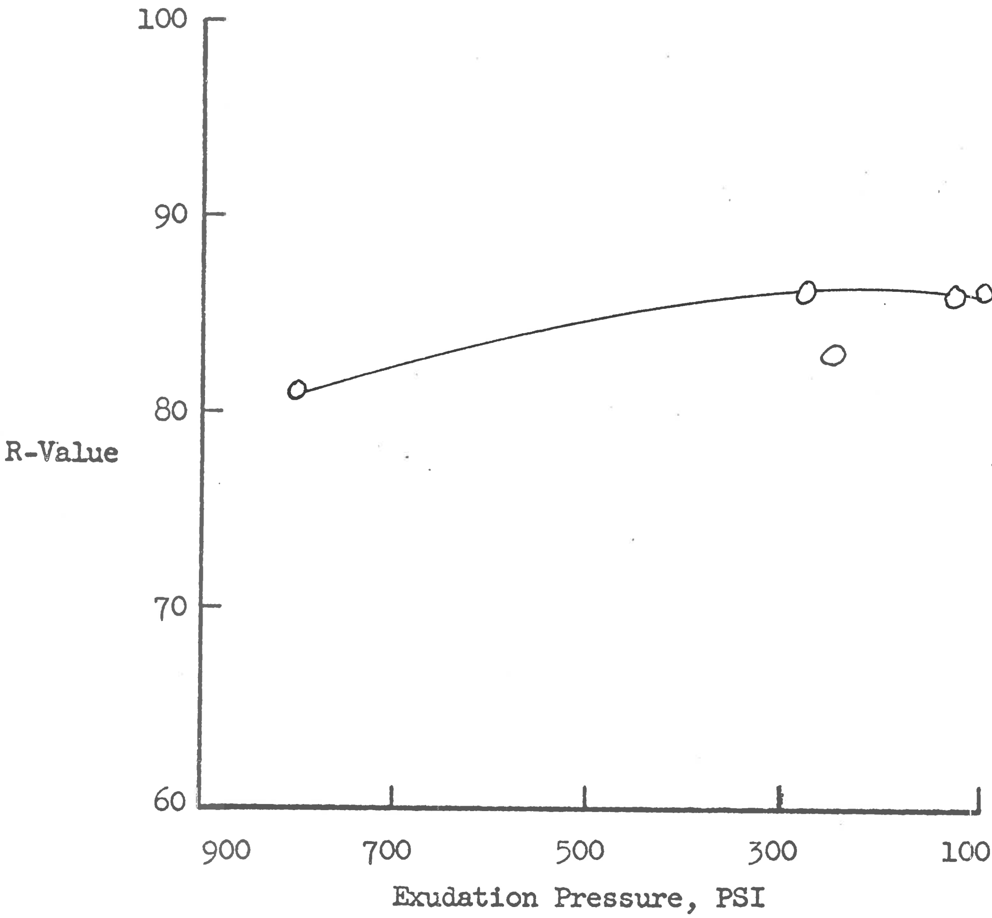
R-Value at 240 PSI: 85
R-Value at 300 PSI: 85

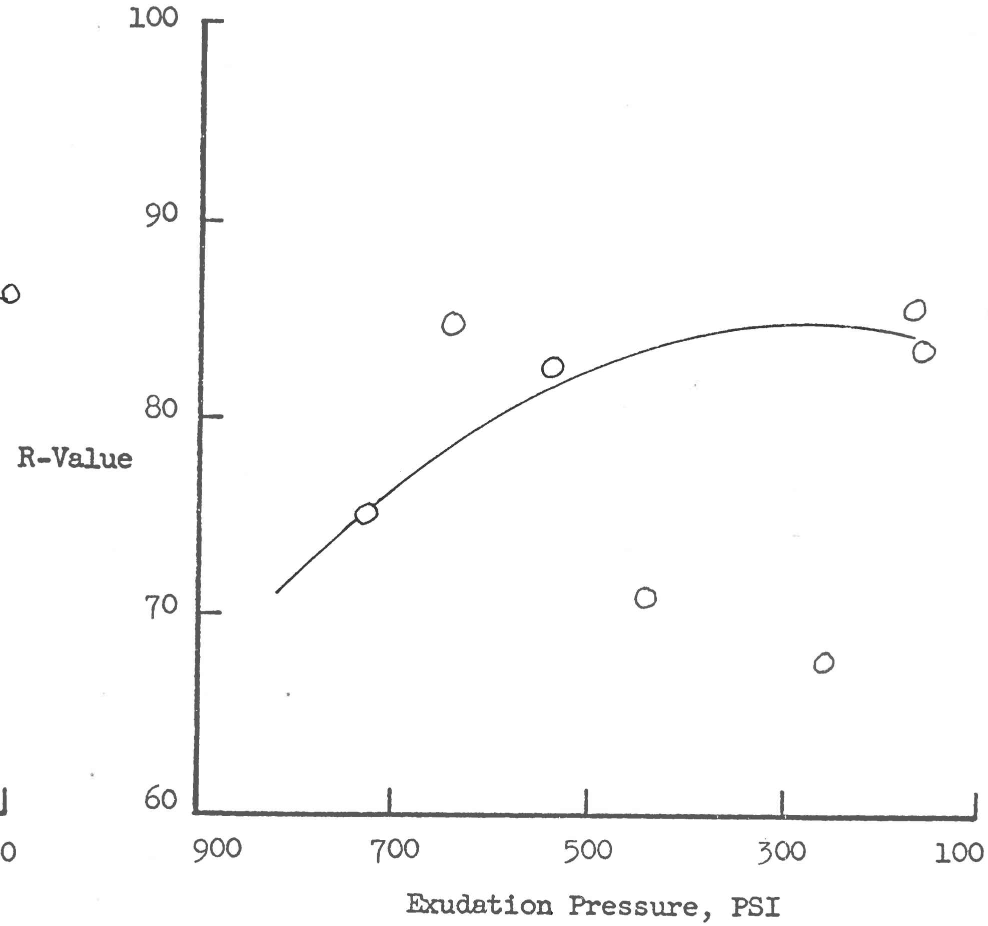




Summary of Data
California R-Value

Sample No.:	334	Sample No.:	335
Date Tested:	5-9-67	Date Tested:	5-9-67
Visual Description:	White Rock Fines	Visual Description:	White Rock Fines
R-Value at 240 PSI:	86	R-Value at 240 PSI:	85
R-Value at 300 PSI:	86	R-Value at 300 PSI:	85

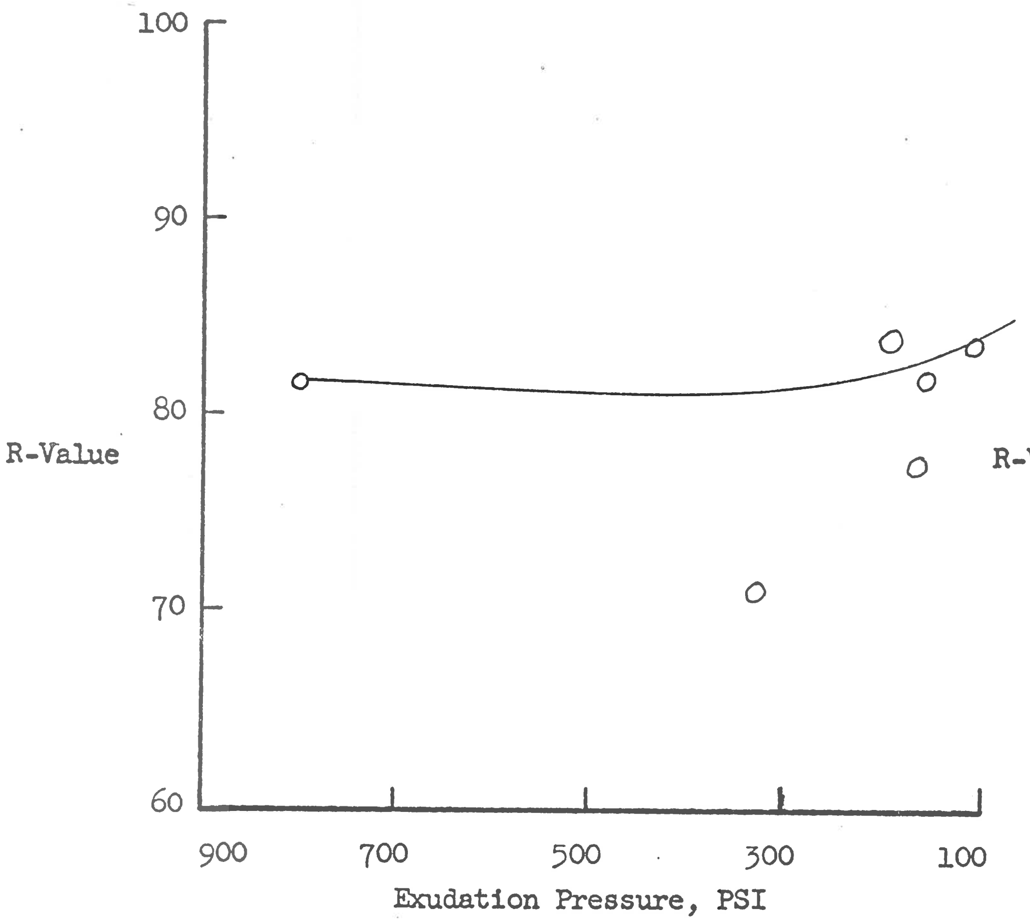




Summary of Data
California R-Value

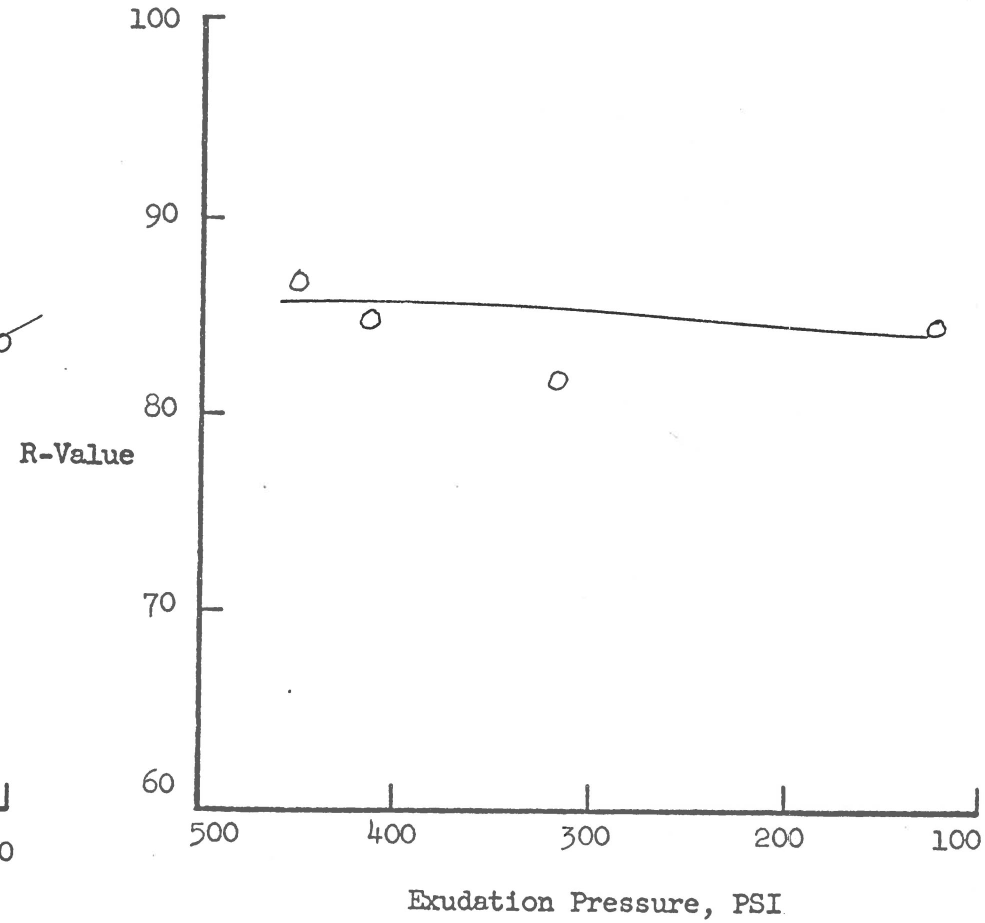
Sample No.: 336
Date Tested: 9-5-67
Visual Description: White Rock Fines

R-Value at 240 PSI: 83
R-Value at 300 PSI: 83



Sample No.: 338
Date Tested: 7-15-66
Visual Description: White Rock Fines

R-Value at 240 PSI: 85
R-Value at 300 PSI: 85



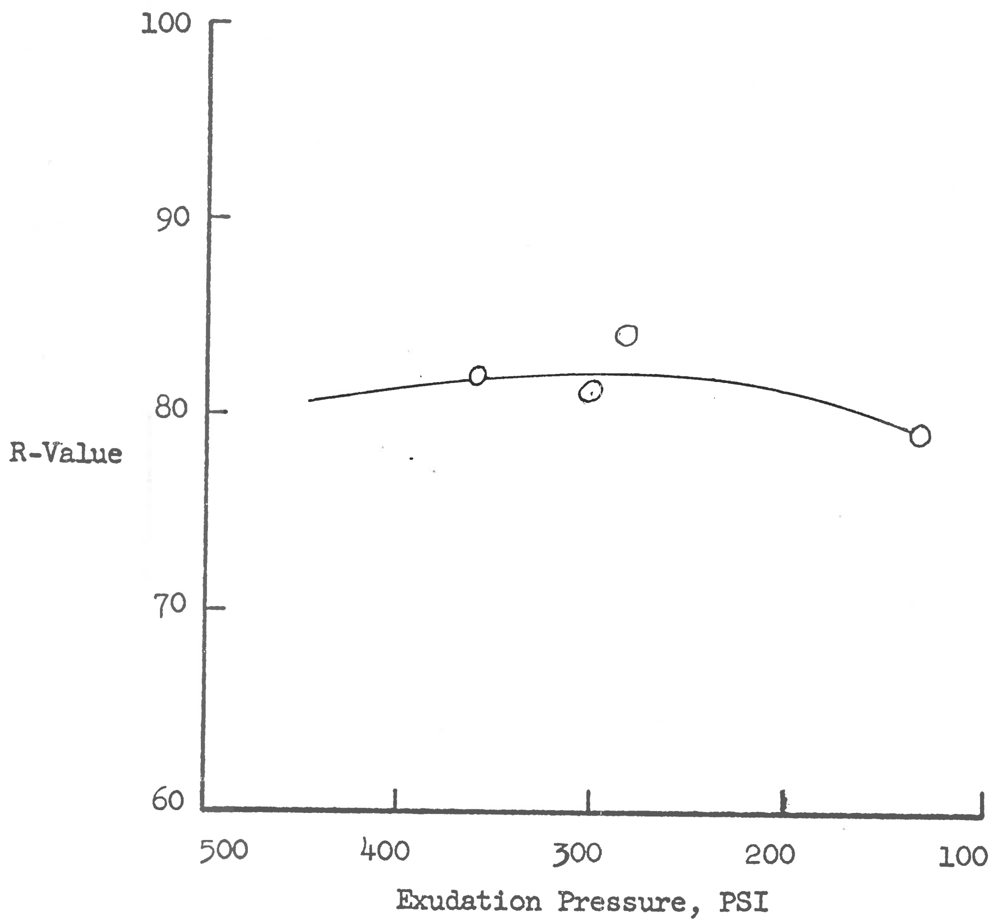
Summary of Data
California R-Value

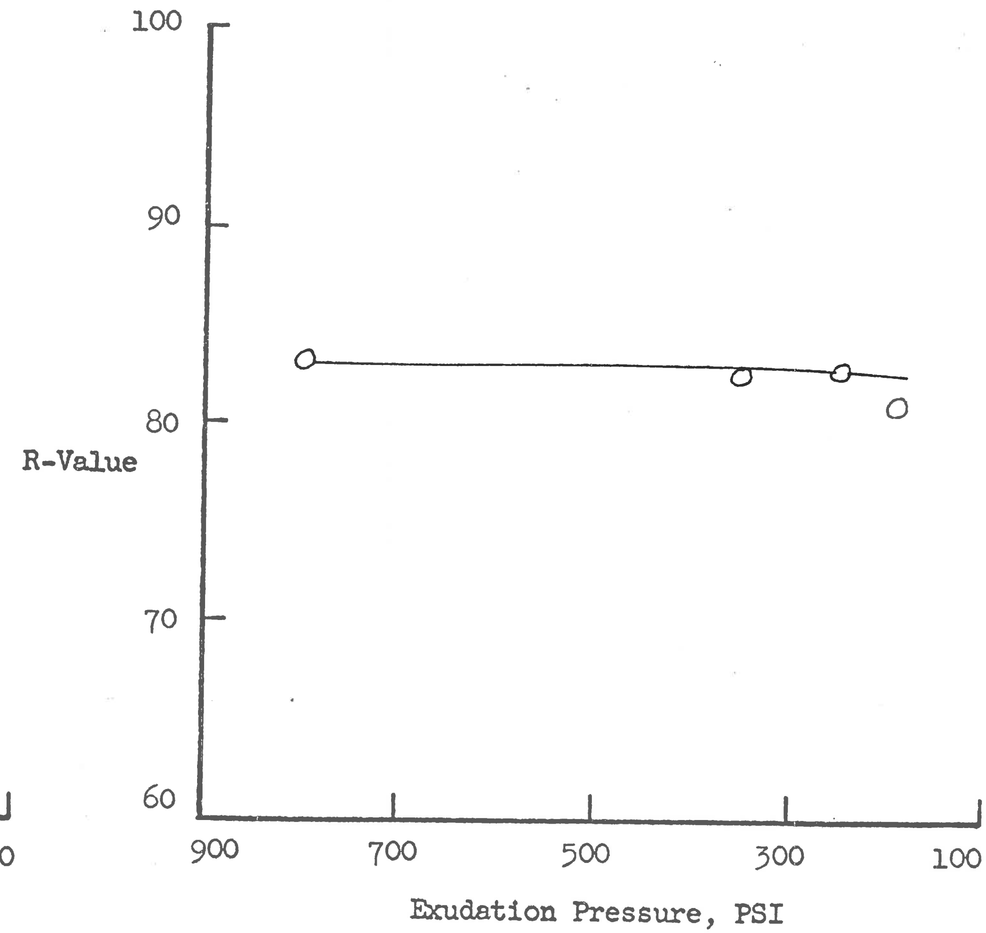
Sample No.: 339
Date Tested: 7-29-66
Visual Description: Brown Sand with Gravel

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82

Sample No.: 340
Date Tested: 7-29-66
Visual Description: Brown Sand

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82

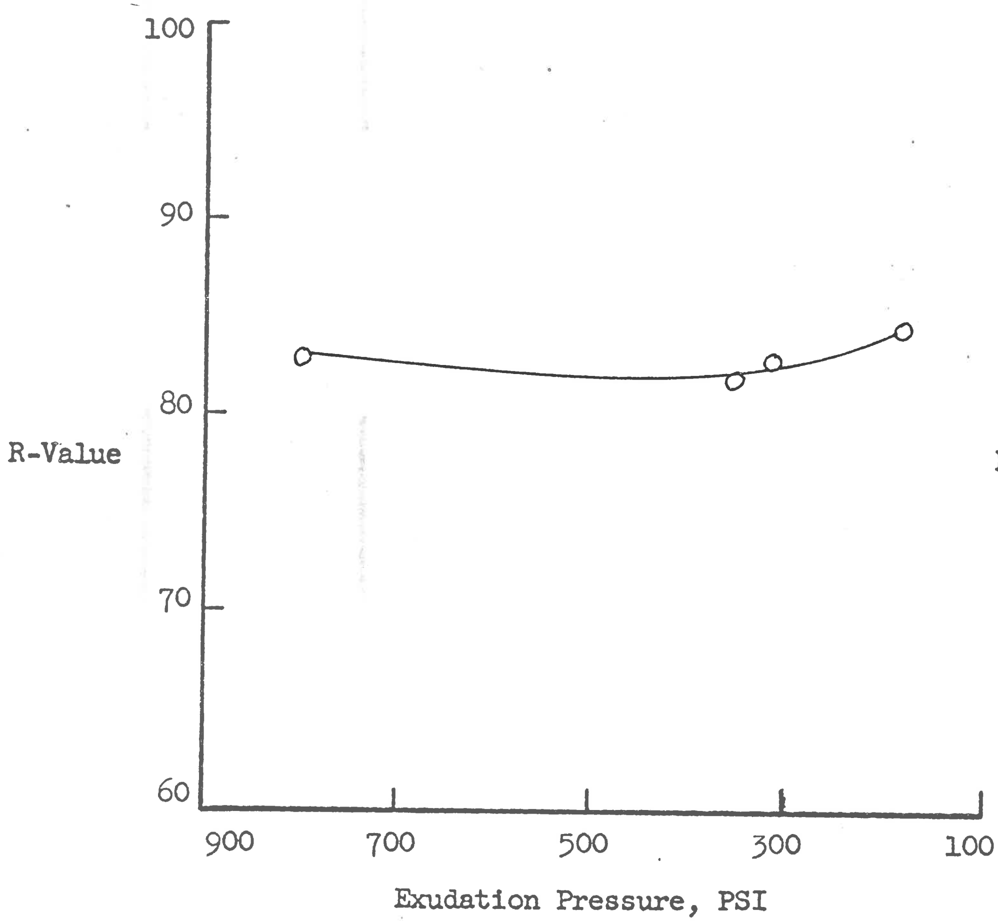




Summary of Data
California R-Value

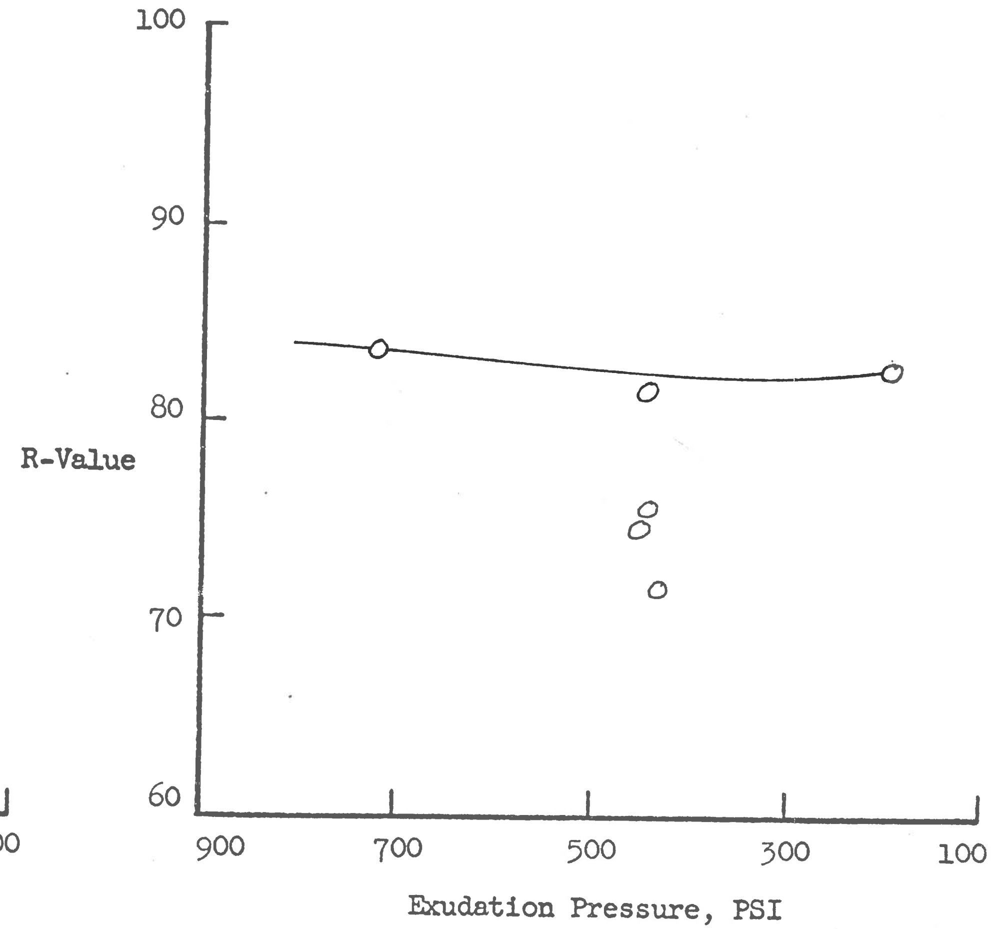
Sample No.: 341
Date Tested: 7-29-66
Visual Description: Brown Sand

R-Value at 240 PSI: 83
R-Value at 300 PSI: 83



Sample No.: 342
Date Tested: 8-2-66
Visual Description: Brown Sand

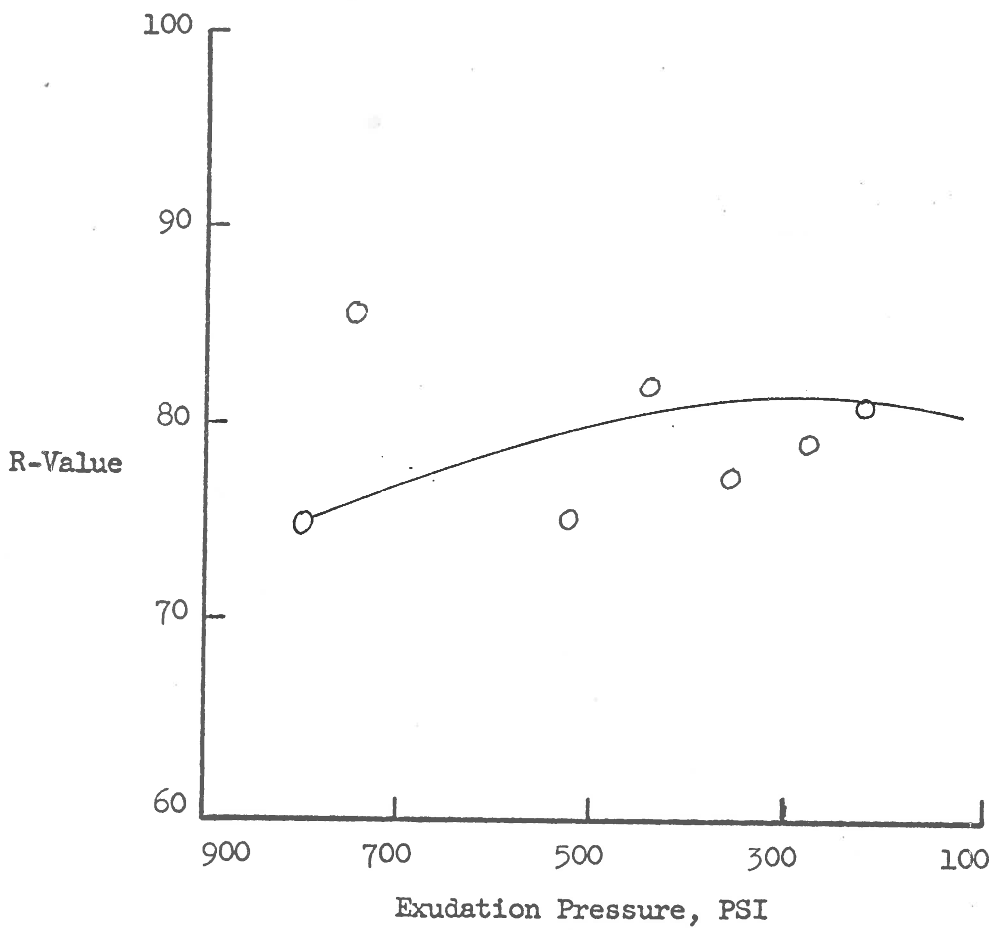
R-Value at 240 PSI: 83
R-Value at 300 PSI: 83



Summary of Data
California R-Value

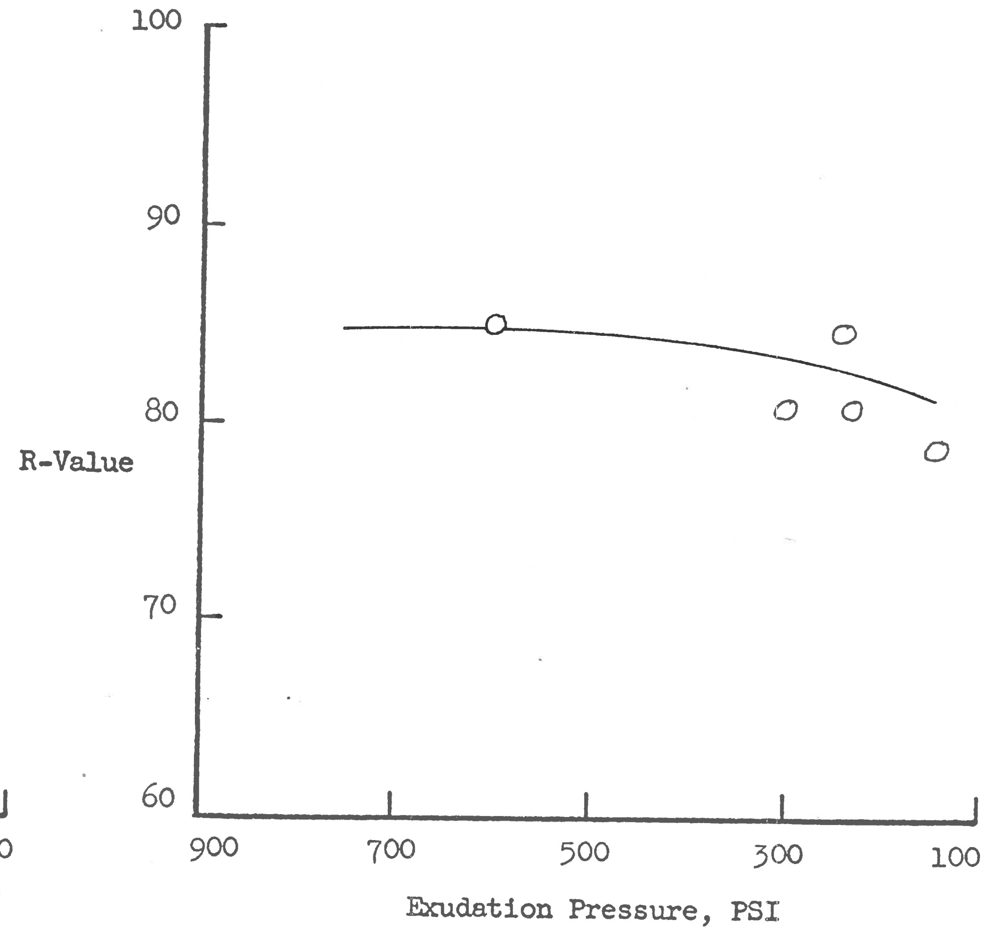
Sample No.: 345
Date Tested: 7-29-66
Visual Description: Brown Sand

R-Value at 240 PSI: 81
R-Value at 300 PSI: 82



Sample No.: 346
Date Tested: 8-2-66
Visual Description: Brown Sand

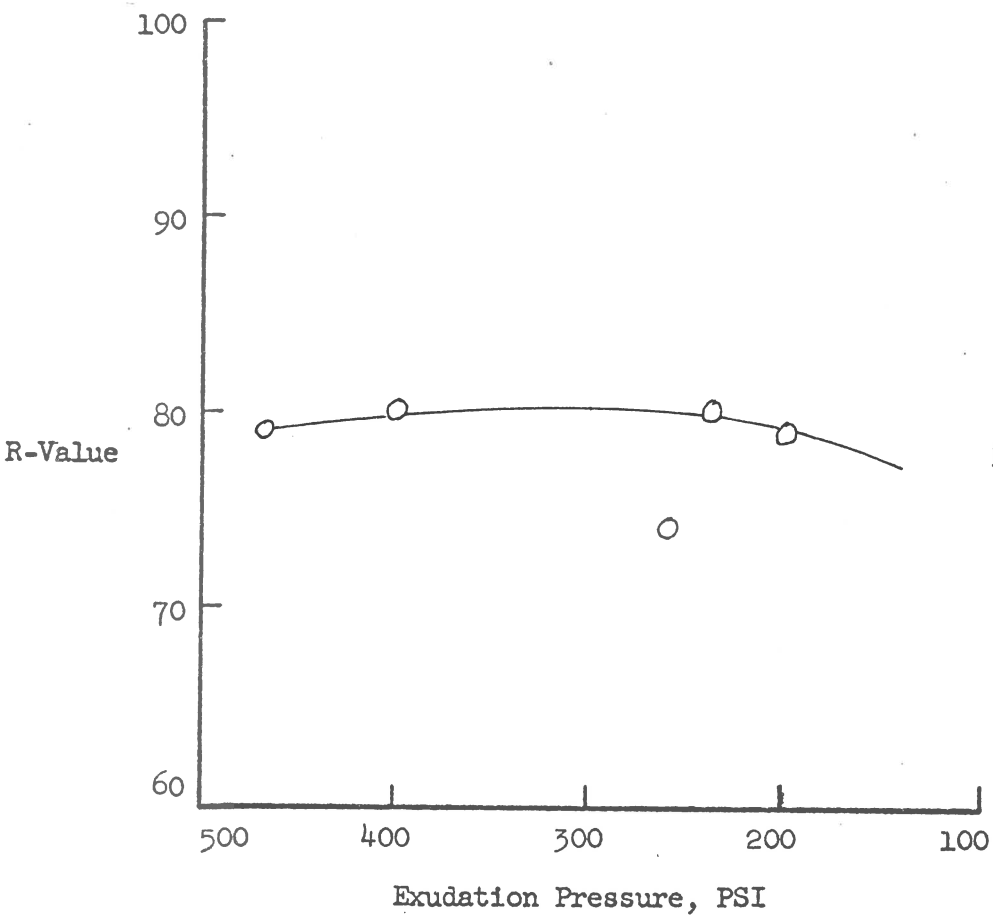
R-Value at 240 PSI: 83
R-Value at 300 PSI: 83



Summary of Data
California R-Value

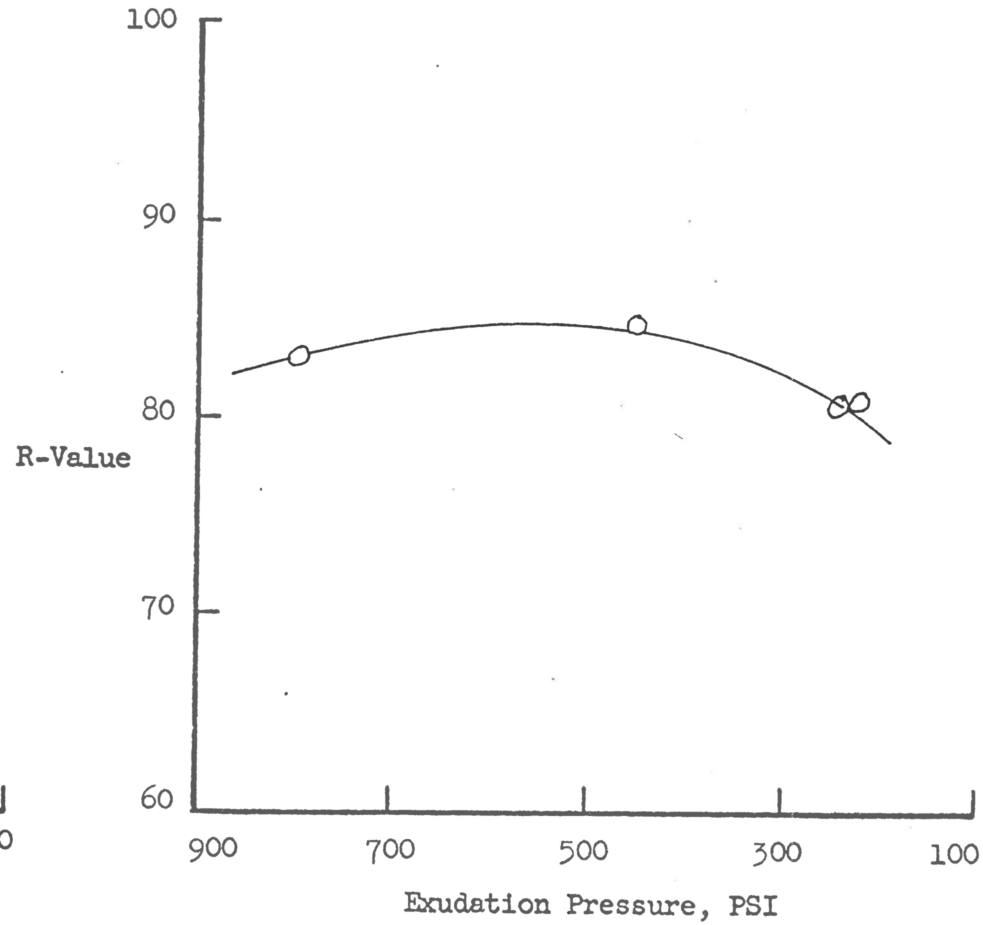
Sample No.: 347
Date Tested: 8-2-66
Visual Description: Brown Sand

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80



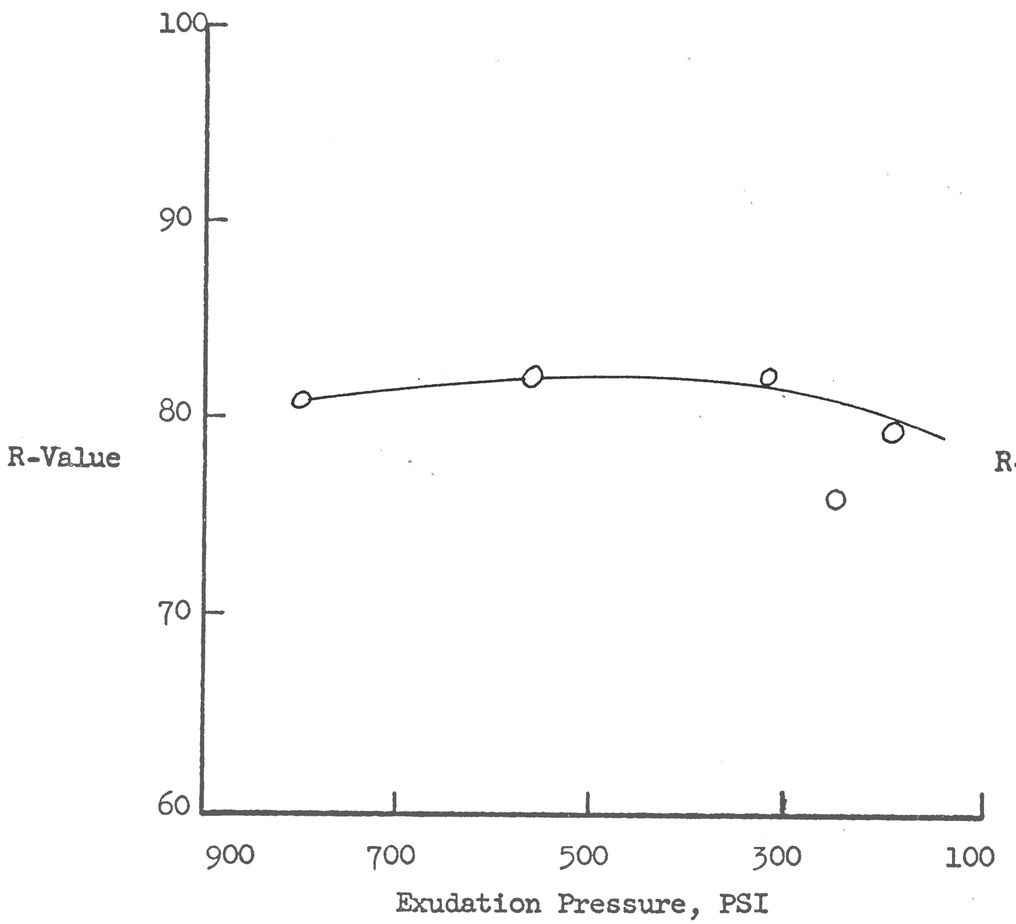
Sample No.: 348
Date Tested: 8-2-66
Visual Description: Brown Sand

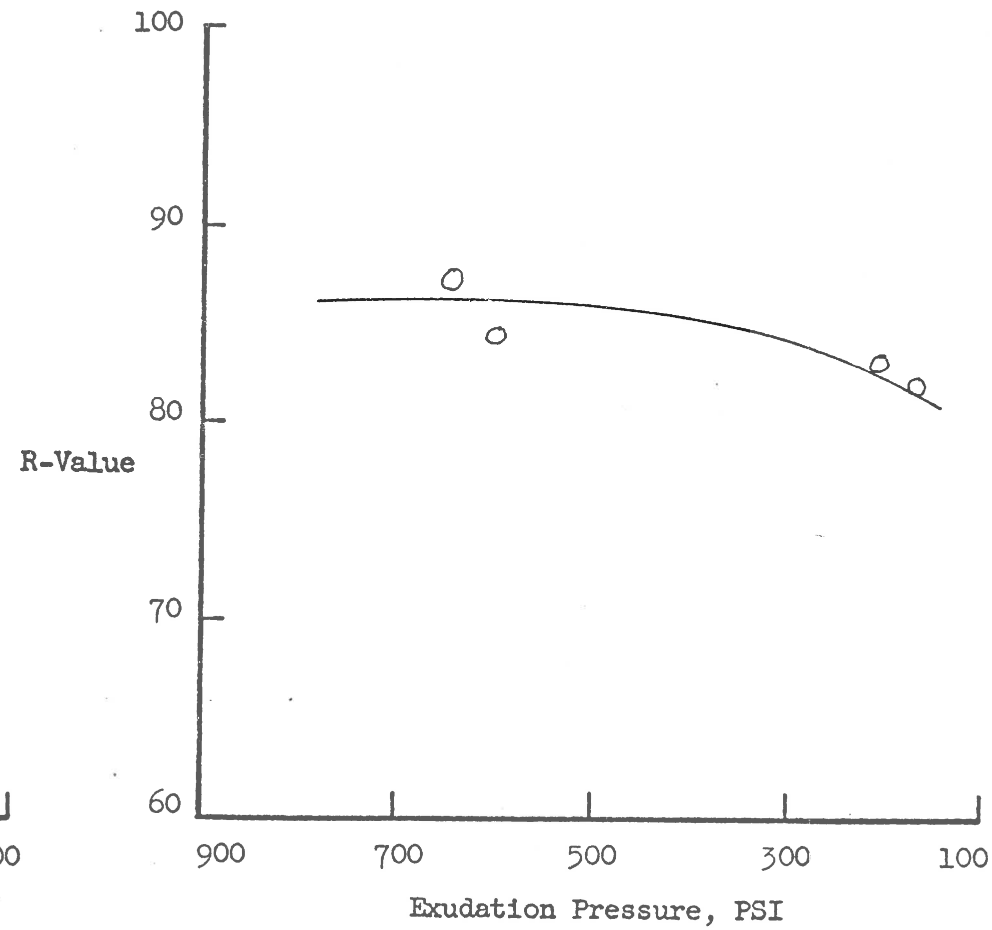
R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



Summary of Data
California R-Value

Sample No.:	349		Sample No.:	350
Date Tested:	8-2-66		Date Tested:	8-3-66
Visual Description:	Brown Sand		Visual Description:	Brown Sand
R-Value at 240 PSI:	81		R-Value at 240 PSI:	83
R-Value at 300 PSI:	81		R-Value at 300 PSI:	84

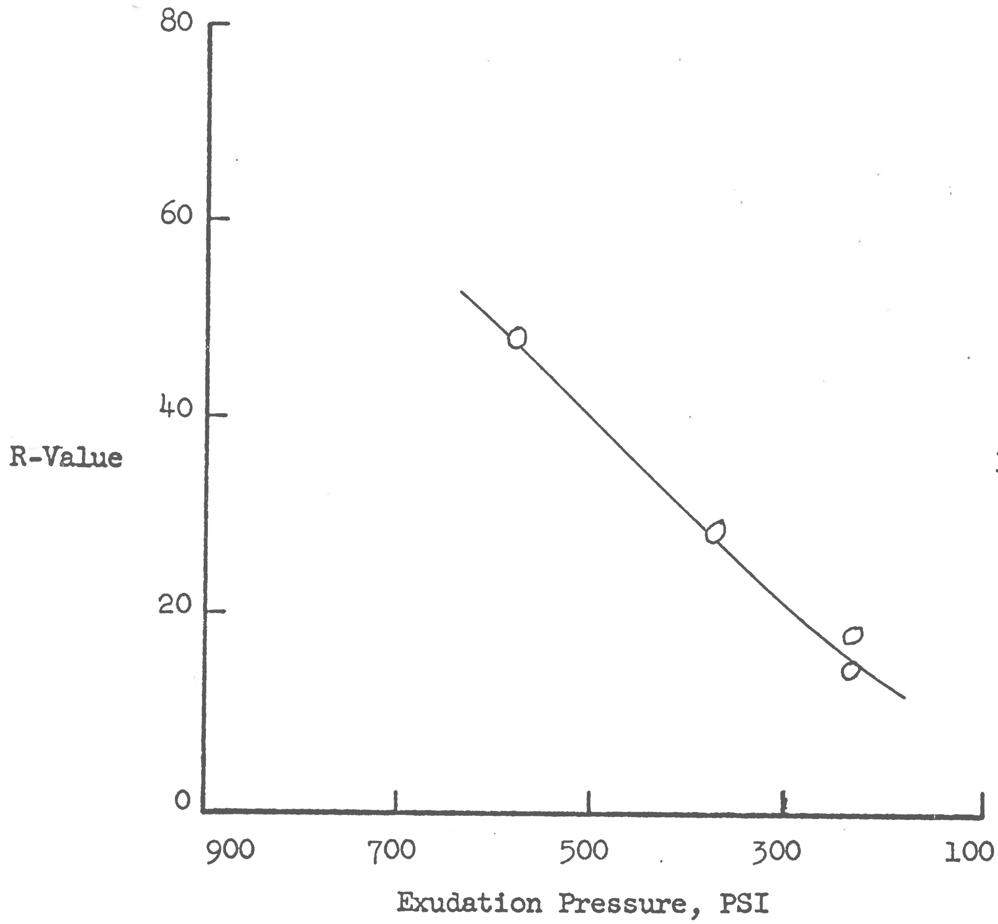




Summary of Data
California R-Value

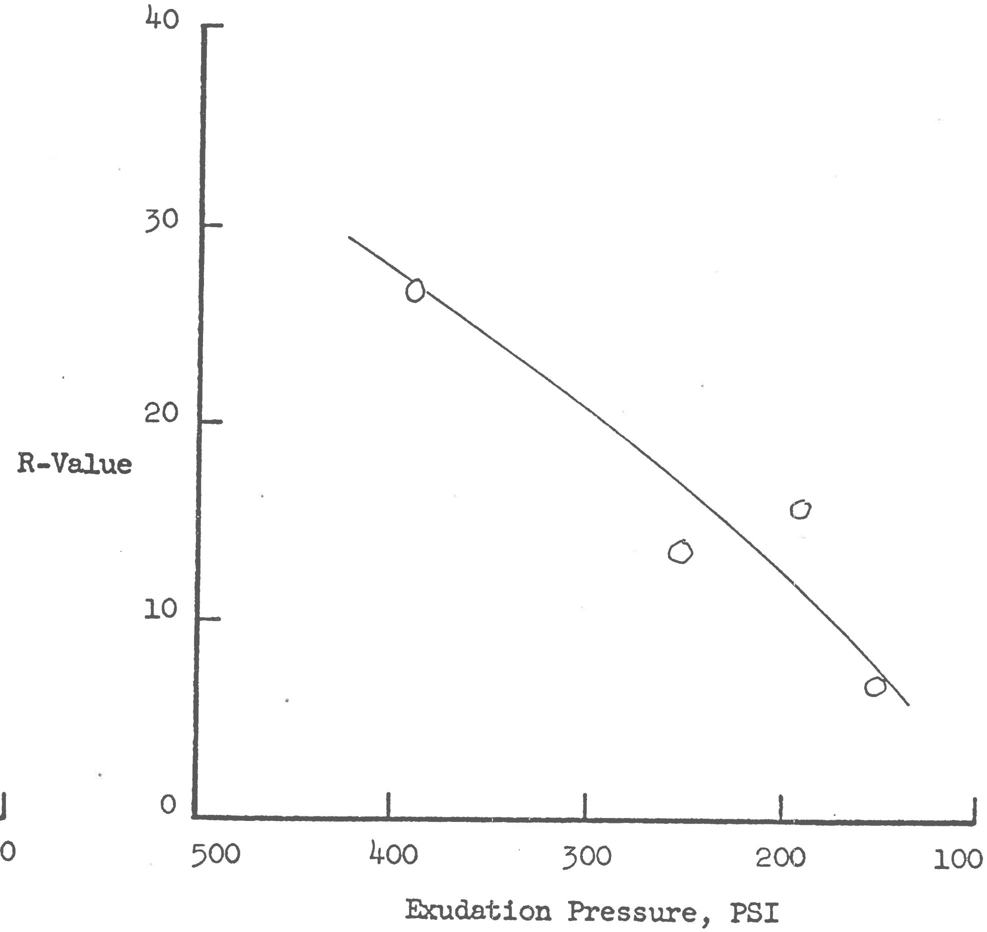
Sample No.: 351
Date Tested: 1-9-66
Visual Description: Red Gravel

R-Value at 240 PSI: 15
R-Value at 300 PSI: 20



Sample No.: 352
Date Tested: 1-7-67
Visual Description: Red Gravel

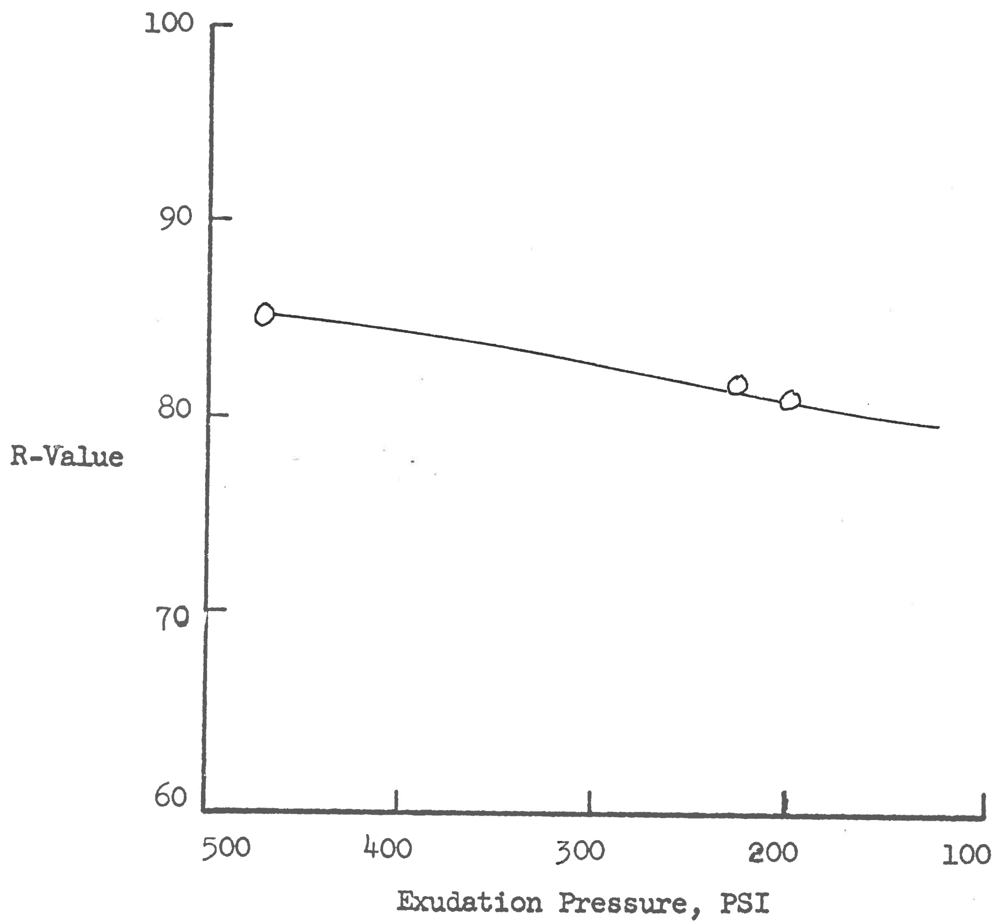
R-Value at 240 PSI: 17
R-Value at 300 PSI: 20



Summary of Data
California R-Value

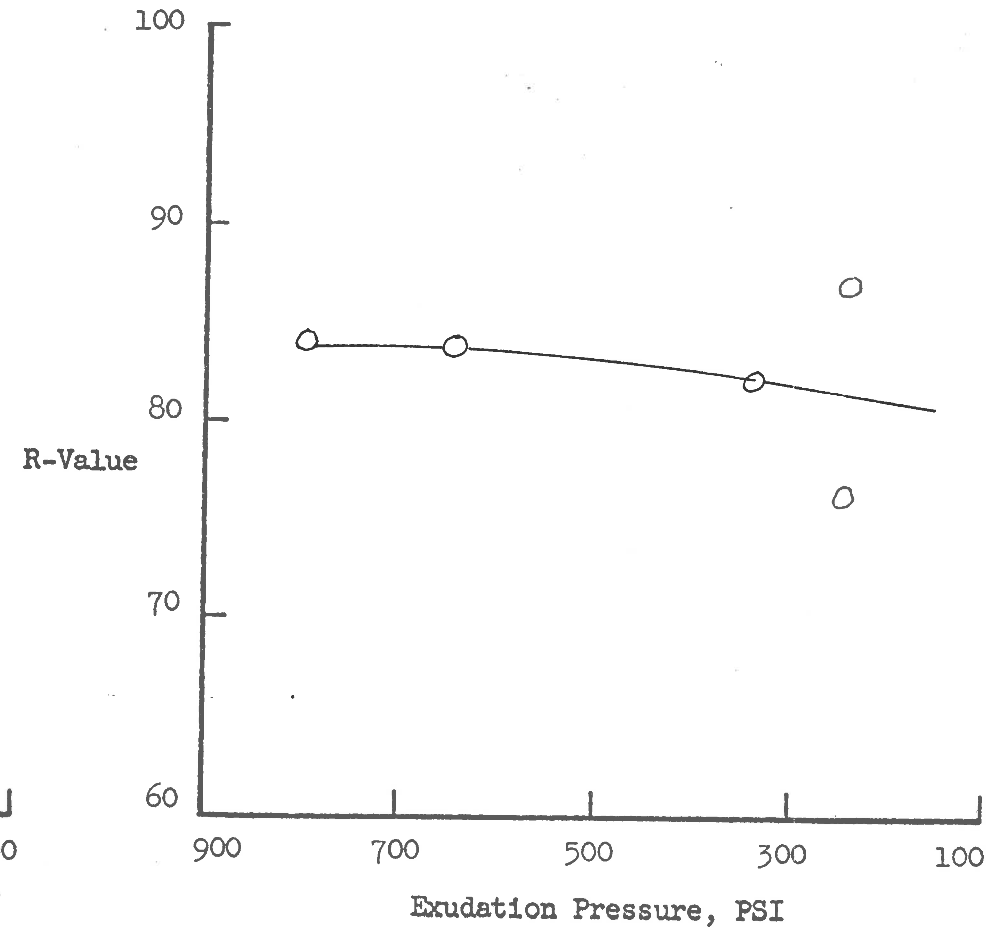
Sample No.: 353
Date Tested: 1-7-67
Visual Description: Sand

R-Value at 240 PSI: 82
R-Value at 300 PSI: 83



Sample No.: 354
Date Tested: 1-7-67
Visual Description: Sand

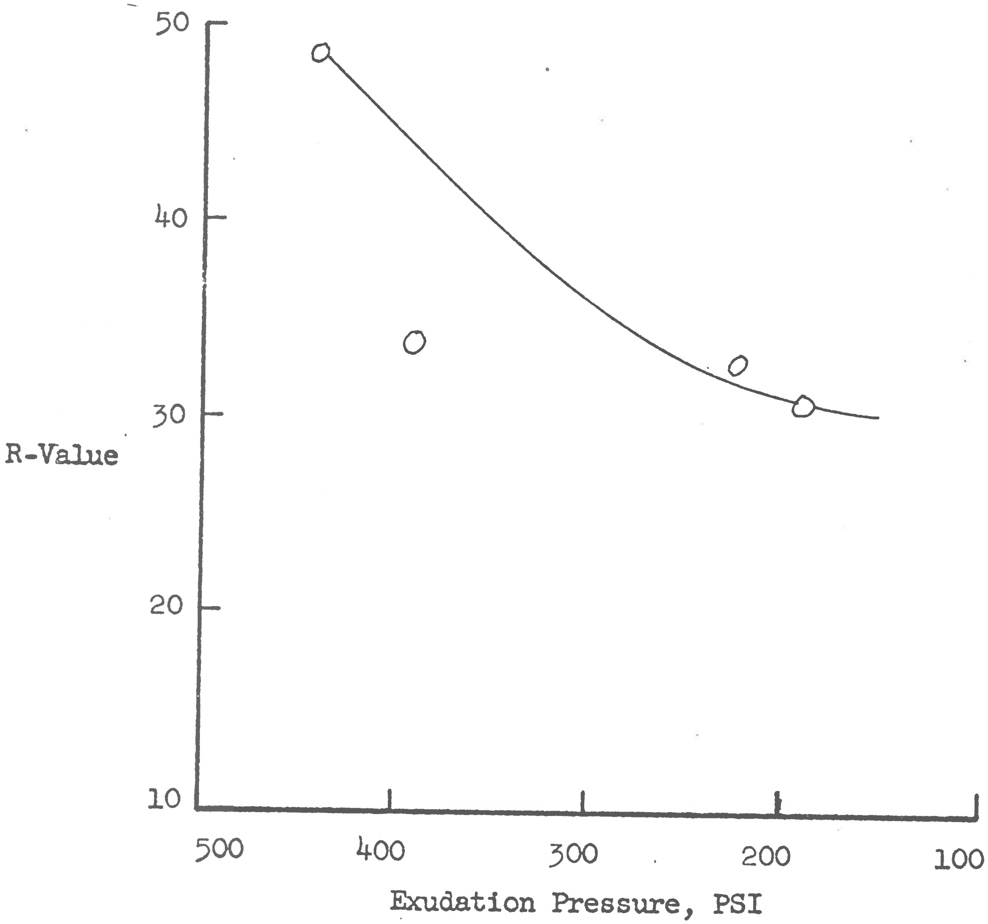
R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



Summary of Data
California R-Value

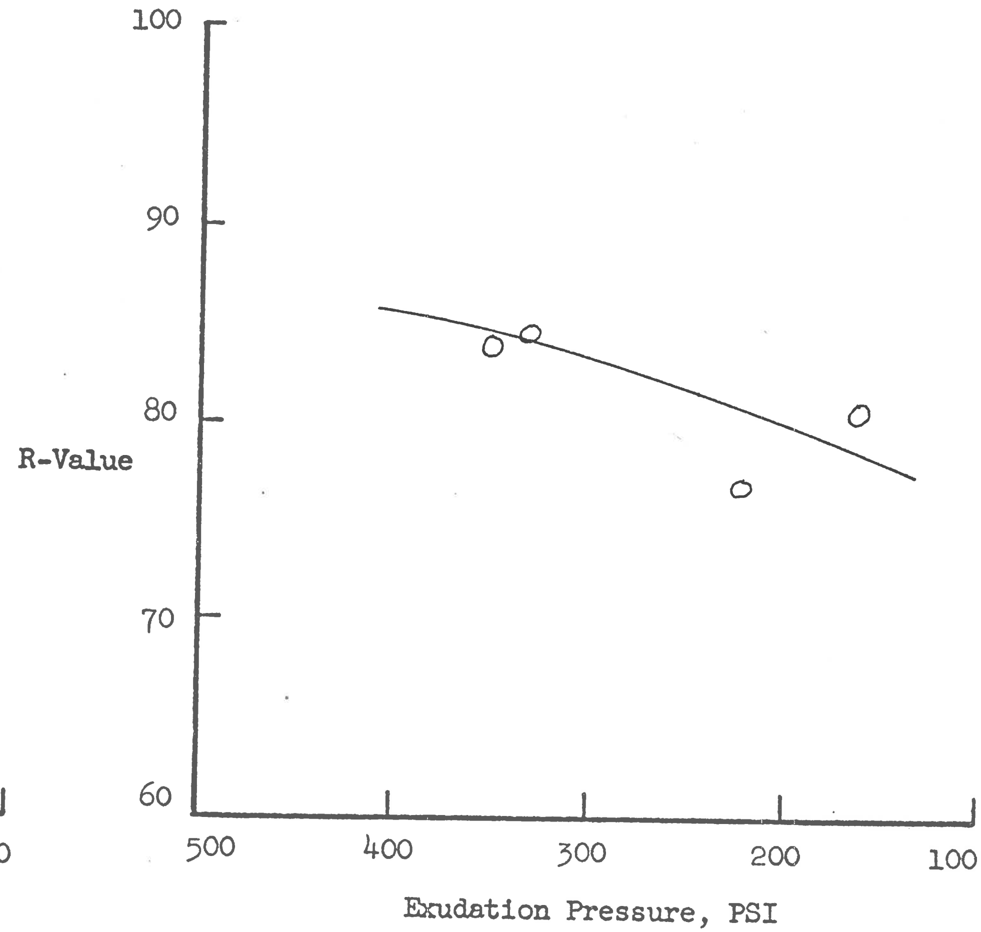
Sample No.: 355
Date Tested: 1-7-67
Visual Description: Tan Clay

R-Value at 240 PSI: 33
R-Value at 300 PSI: 36



Sample No.: 356
Date Tested: 1-7-67
Visual Description: Sand

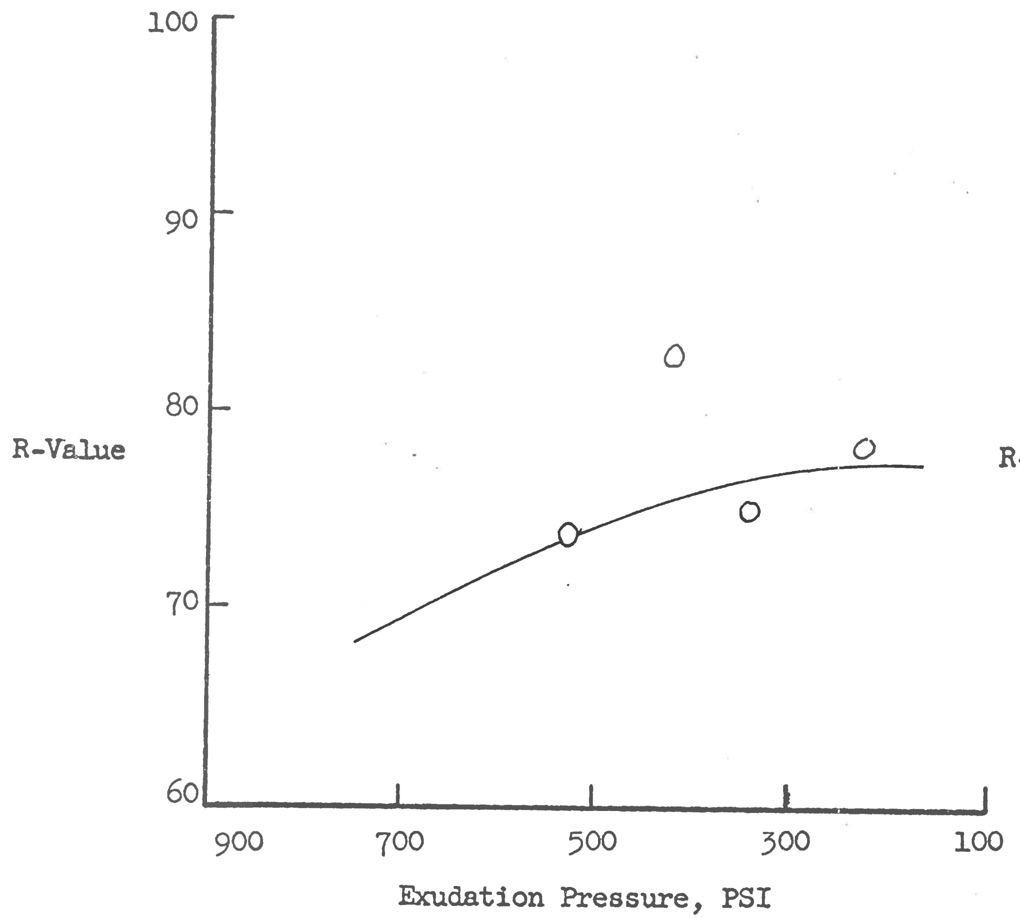
R-Value at 240 PSI: 83
R-Value at 300 PSI: 84



Summary of Data
California R-Value

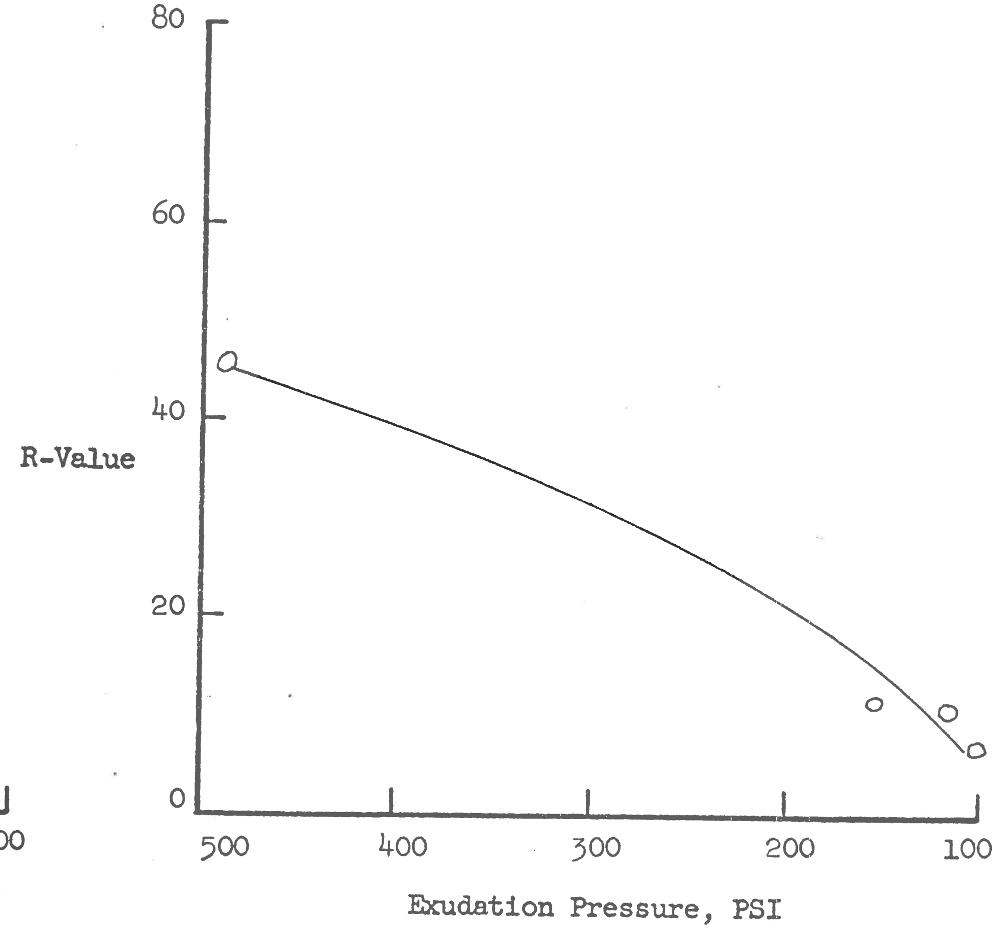
Sample No.: 357
Date Tested: 1-7-67
Visual Description: Sand

R-Value at 240 PSI: 77
R-Value at 300 PSI: 77



Sample No.: 358
Date Tested: 1-7-67
Visual Description: Tan Clay

R-Value at 240 PSI: 26
R-Value at 300 PSI: 32



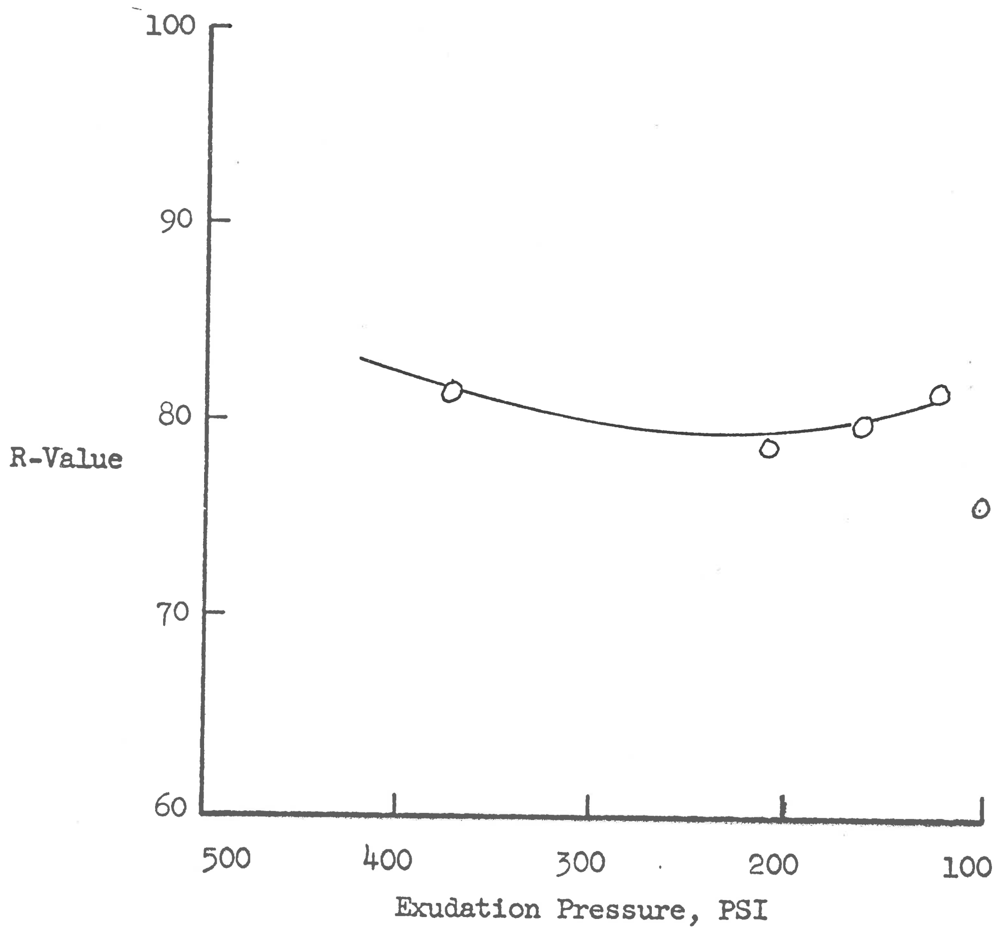
Summary of Data
California R-Value

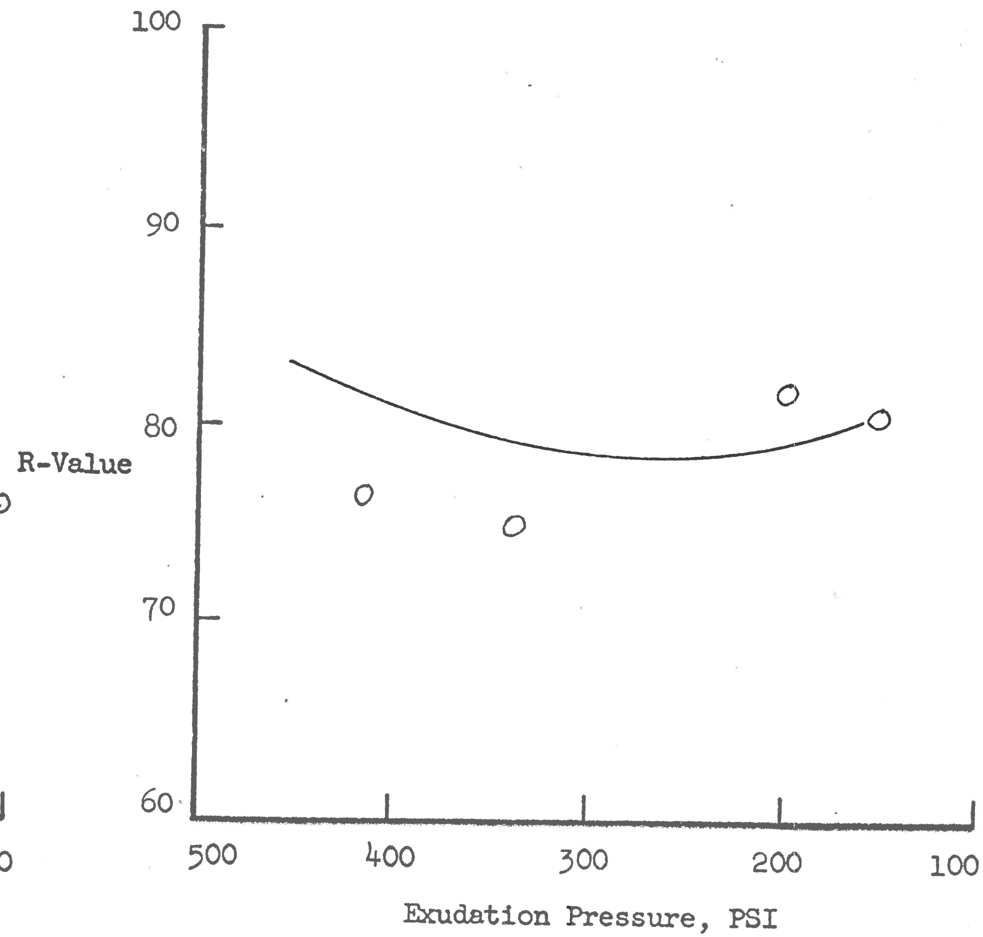
Sample No.: 359
Date Tested: 1-7-67
Visual Description: Sand

R-Value at 240 PSI: 81
R-Value at 300 PSI: 82

Sample No.: 360
Date Tested: 1-7-67
Visual Description: Sand

R-Value at 240 PSI: 79
R-Value at 300 PSI: 79

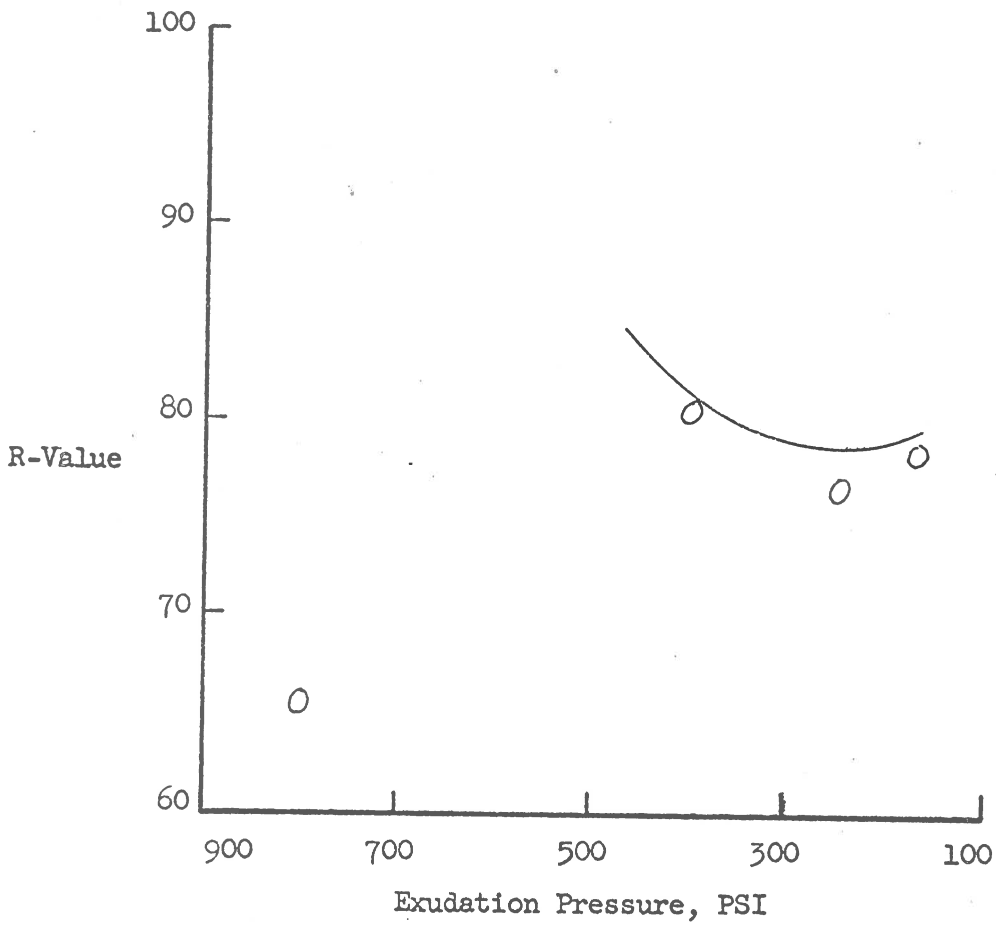




Summary of Data
California R-Value

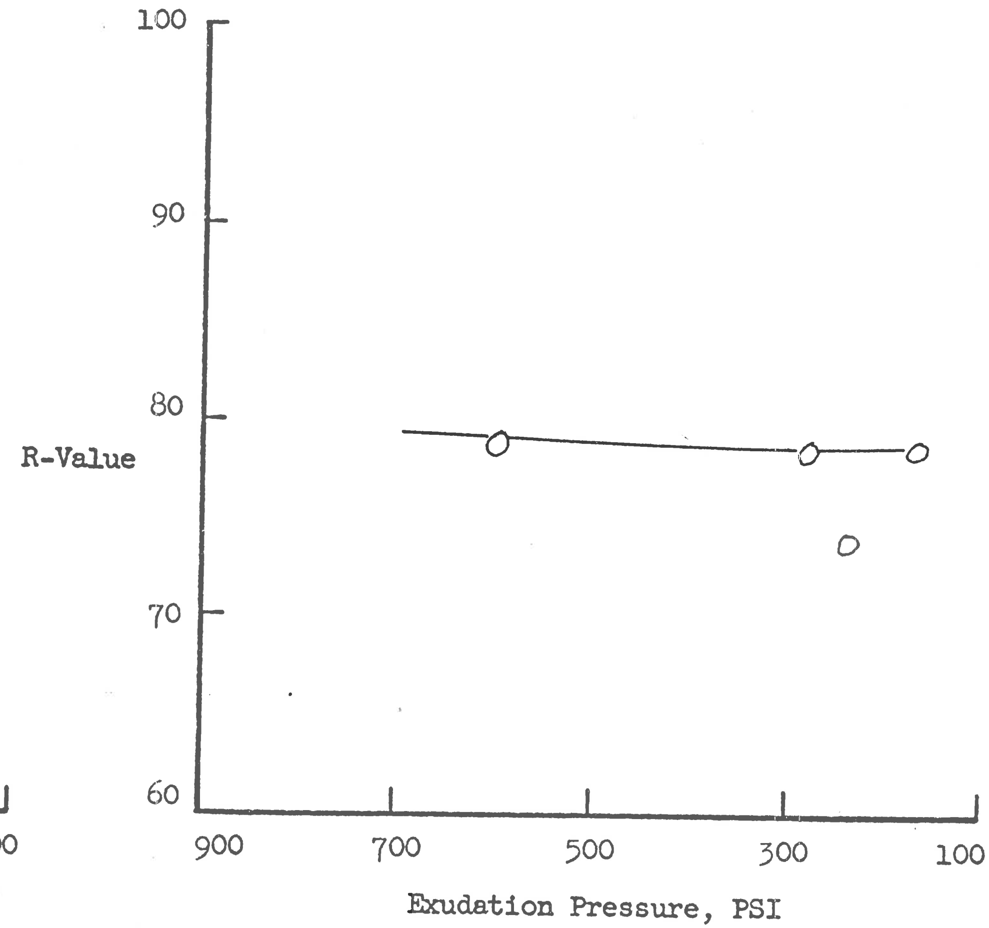
Sample No.: 361
Date Tested: 1-7-67
Visual Description: Sand

R-Value at 240 PSI: 78
R-Value at 300 PSI: 80



Sample No.: 362
Date Tested: 1-7-67
Visual Description: Sand

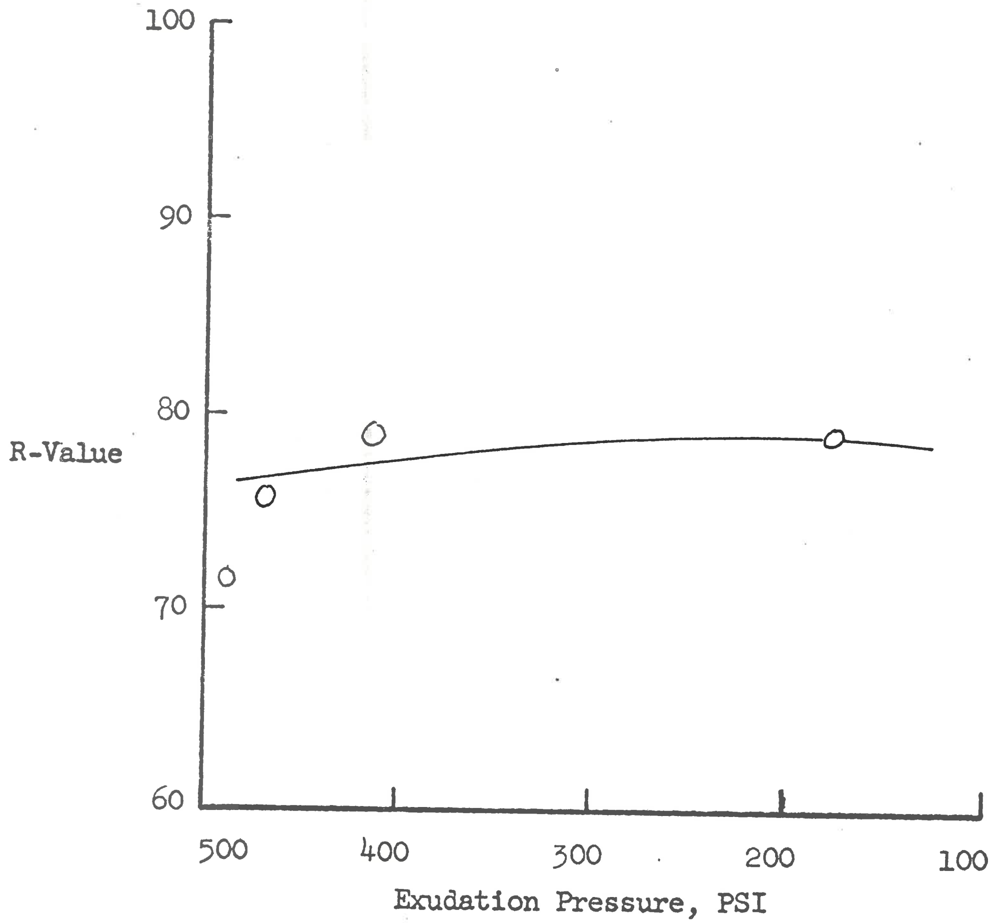
R-Value at 240 PSI: 79
R-Value at 300 PSI: 79



Summary of Data
California R-Value

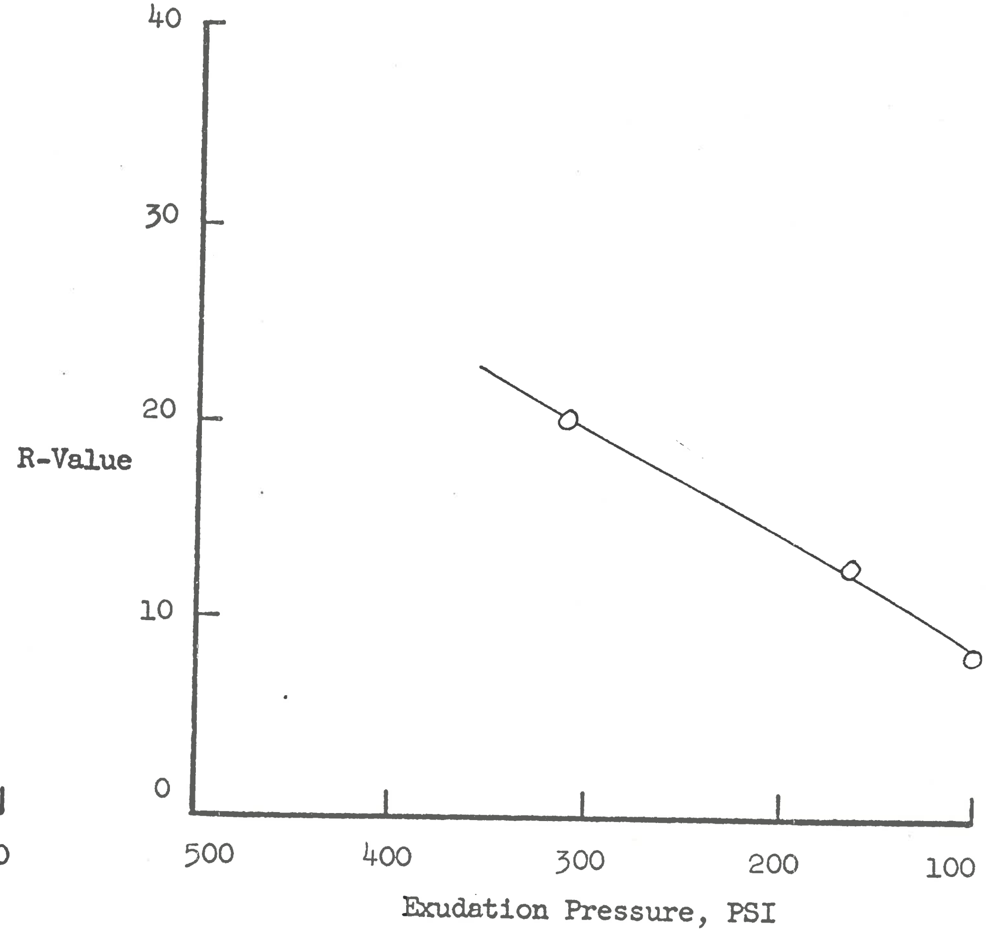
Sample No.: 363
Date Tested: 1-7-67
Visual Description: Sand

R-Value at 240 PSI: 78
R-Value at 300 PSI: 78



Sample No.: 400
Date Tested: 2-26-68
Visual Description: Sandy Silt with Gravel

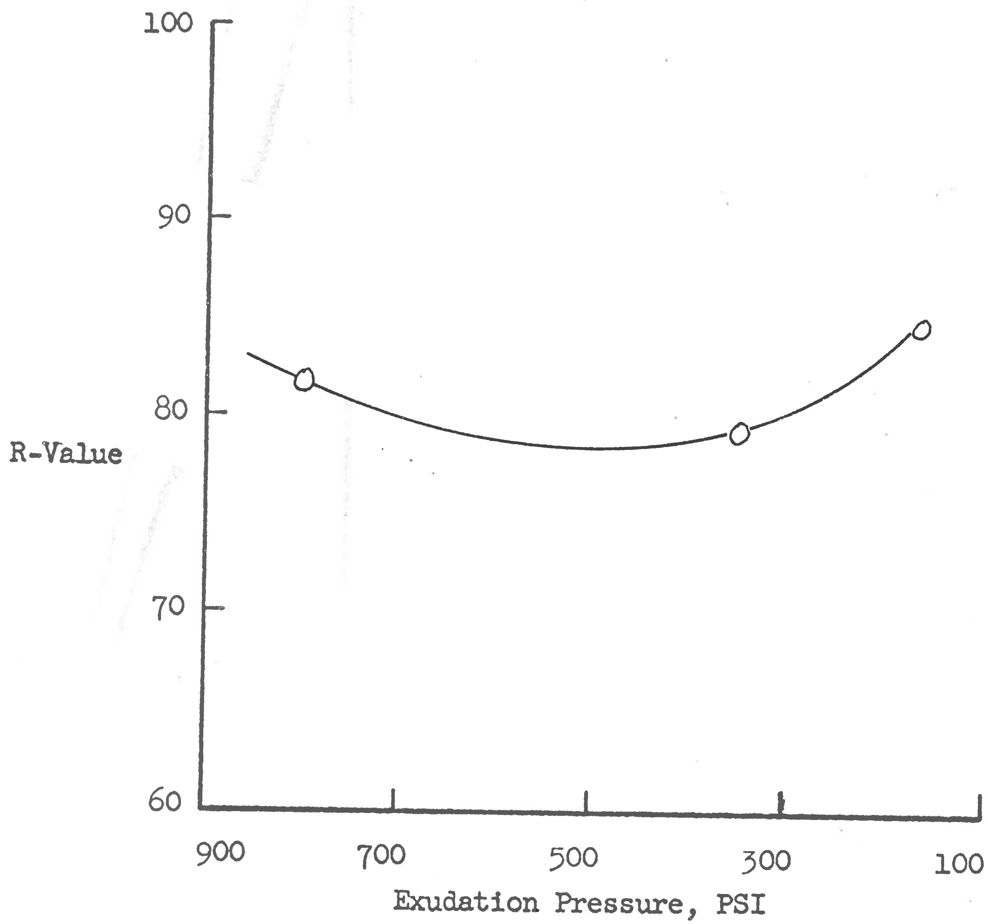
R-Value at 240 PSI: 17
R-Value at 300 PSI: 20



Summary of Data
California R-Value

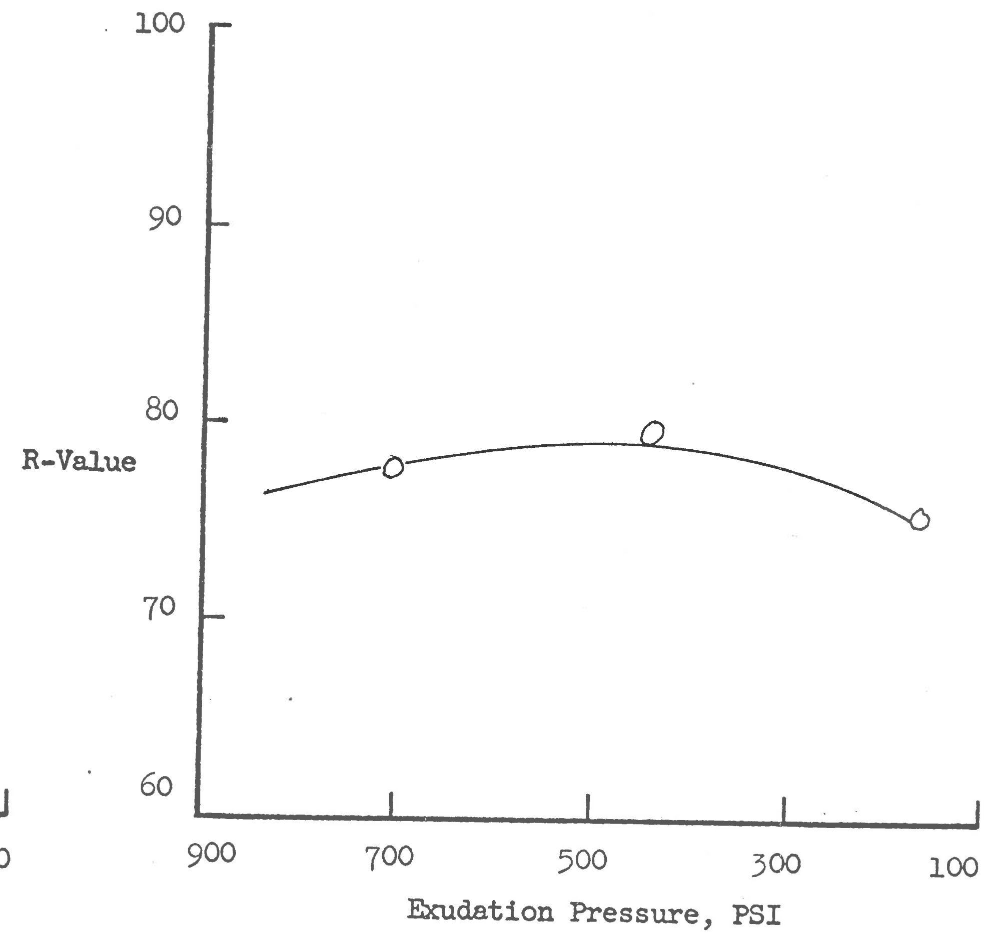
Sample No.: 401
Date Tested: 2-20-68
Visual Description: Sand and Gravel

R-Value at 240 PSI: 82
R-Value at 300 PSI: 80



Sample No.: 402
Date Tested: 2-20-68
Visual Description: Sand

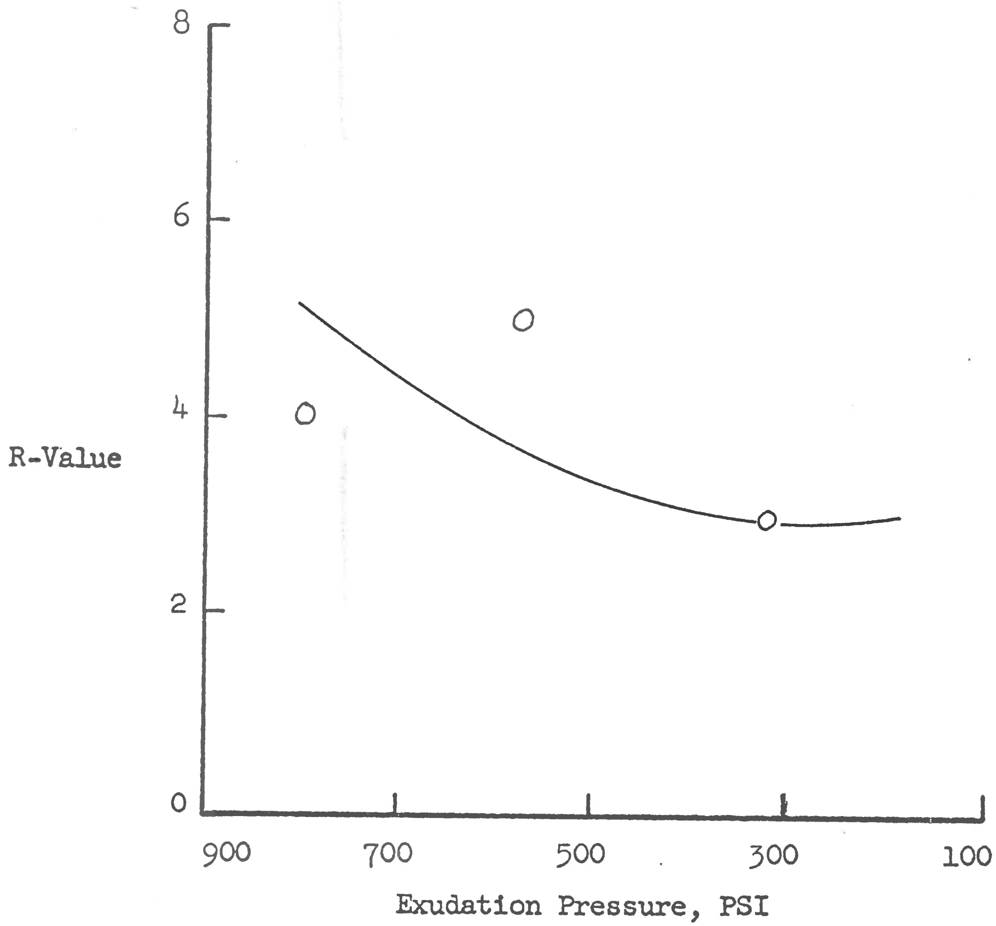
R-Value at 240 PSI: 77
R-Value at 300 PSI: 78



Summary of Data
California R-Value

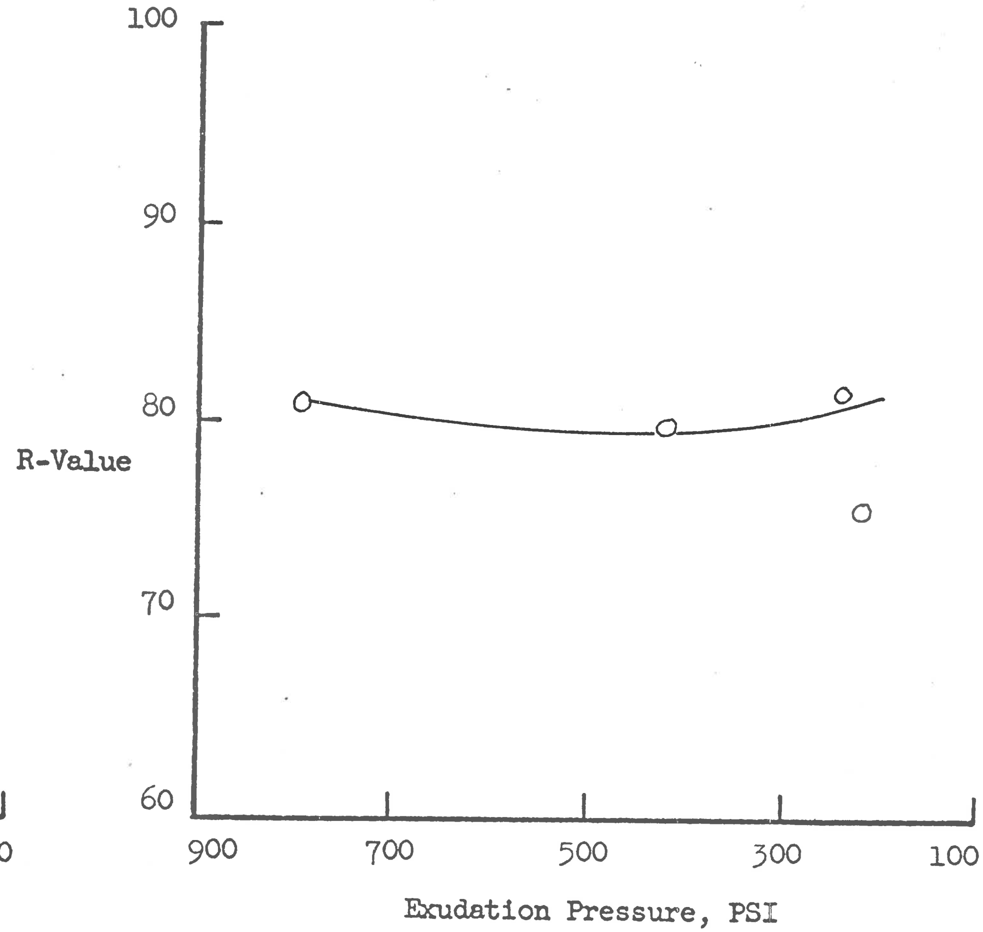
Sample No.: 403
Date Tested: 2-21-68
Visual Description: Black Organic Clay

R-Value at 240 PSI: 03
R-Value at 300 PSI: 03



Sample No.: 404
Date Tested: 2-20-68
Visual Description: Red Clayey Sand with Gravel

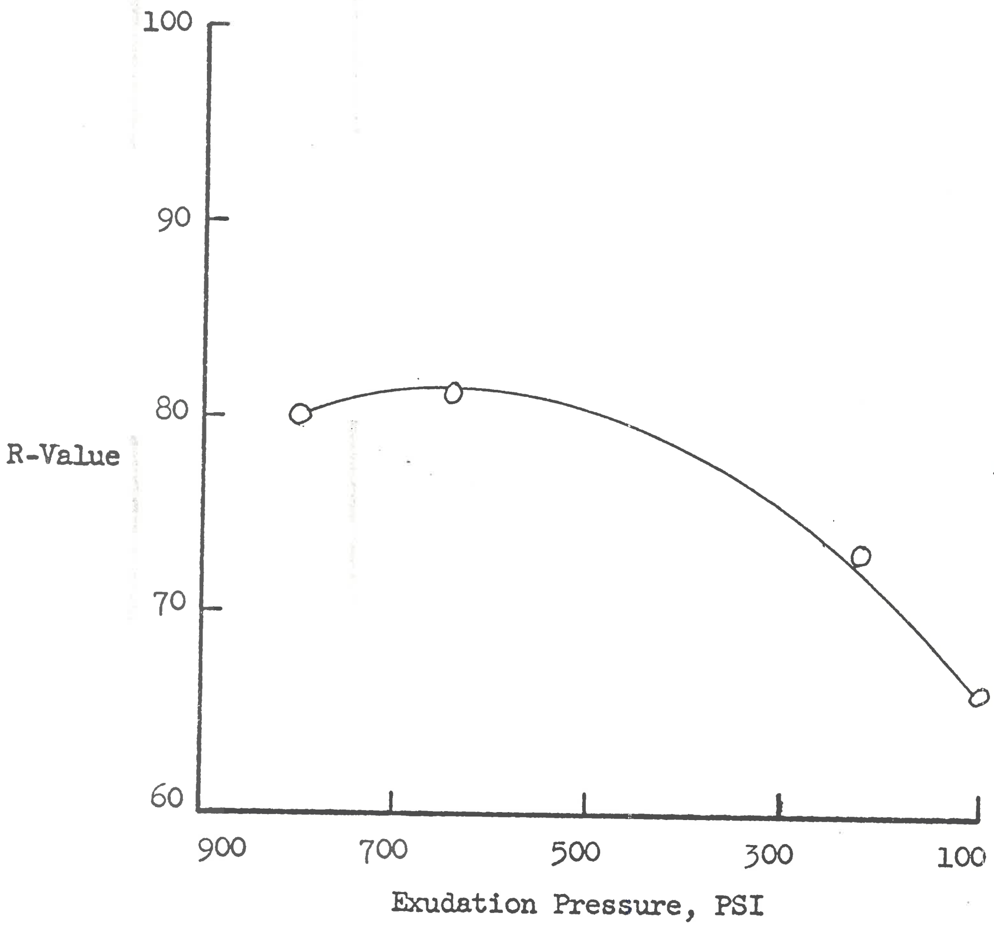
R-Value at 240 PSI: 81
R-Value at 300 PSI: 80



Summary of Data
California R-Value

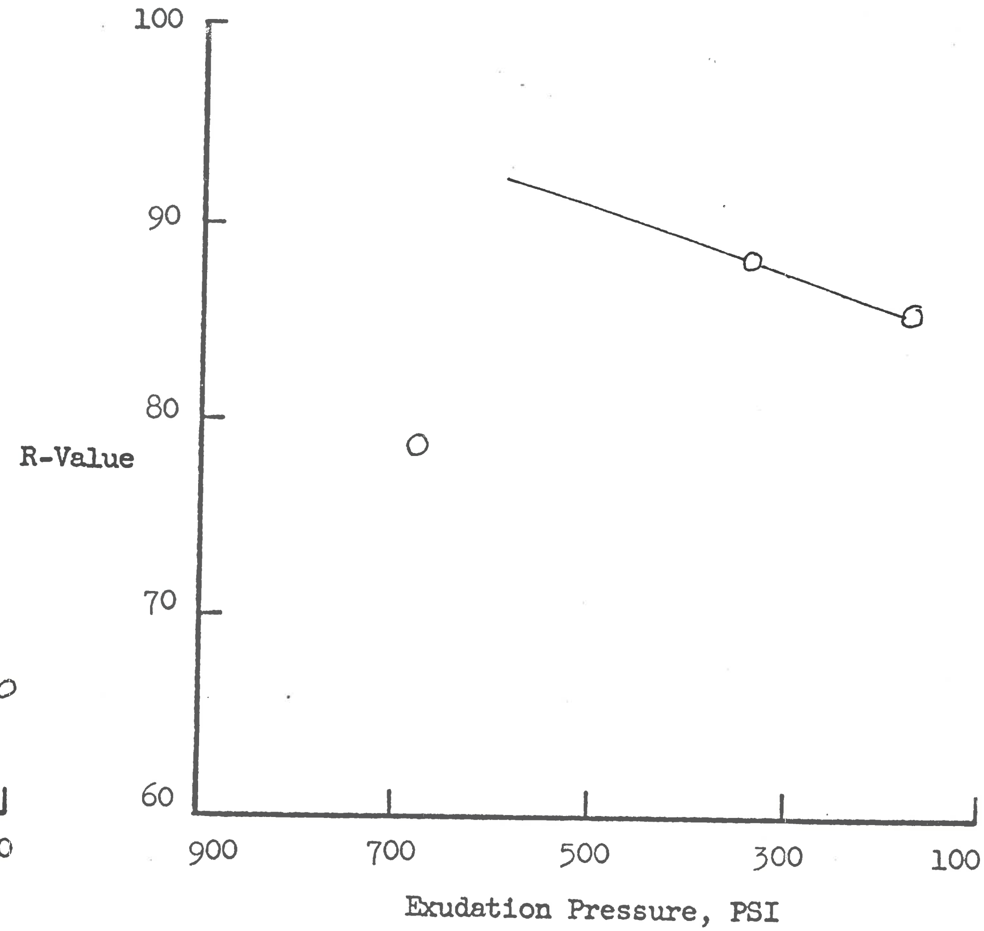
Sample No.: 405
Date Tested: 2-20-68
Visual Description: Black Silty Clay

R-Value at 240 PSI: 74
R-Value at 300 PSI: 76



Sample No.: 406
Date Tested: 2-26-68
Visual Description: Sand and Gravel

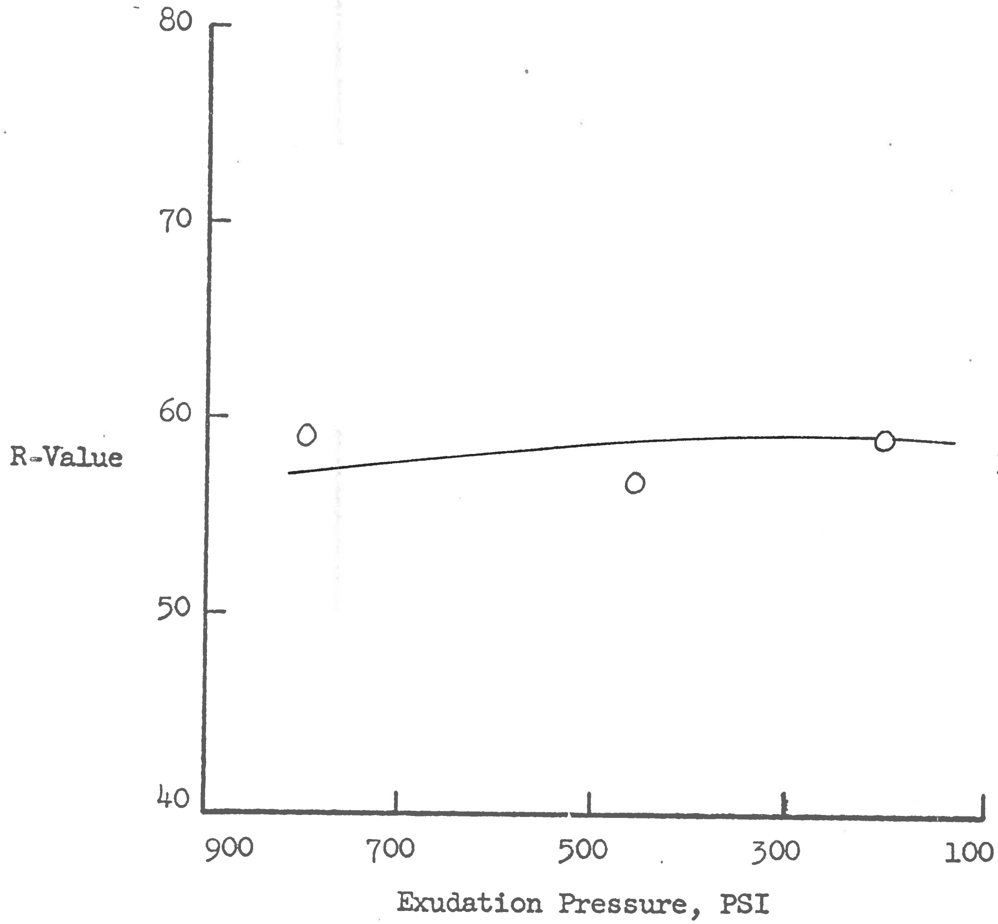
R-Value at 240 PSI: 87
R-Value at 300 PSI: 88



Summary of Data
California R-Value

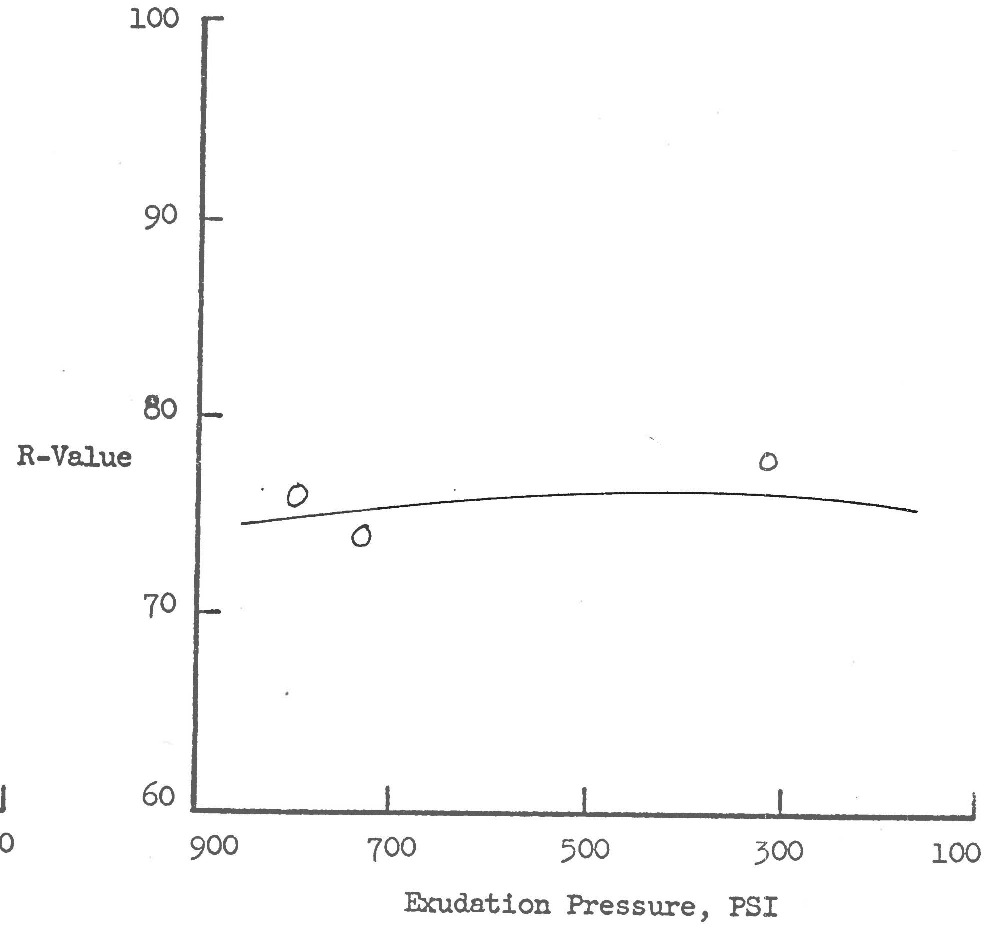
Sample No.: 407
Date Tested: 2-20-68
Visual Description: Silt

R-Value at 240 PSI: 59
R-Value at 300 PSI: 59



Sample No.: 408
Date Tested: 2-20-68
Visual Description: Sand

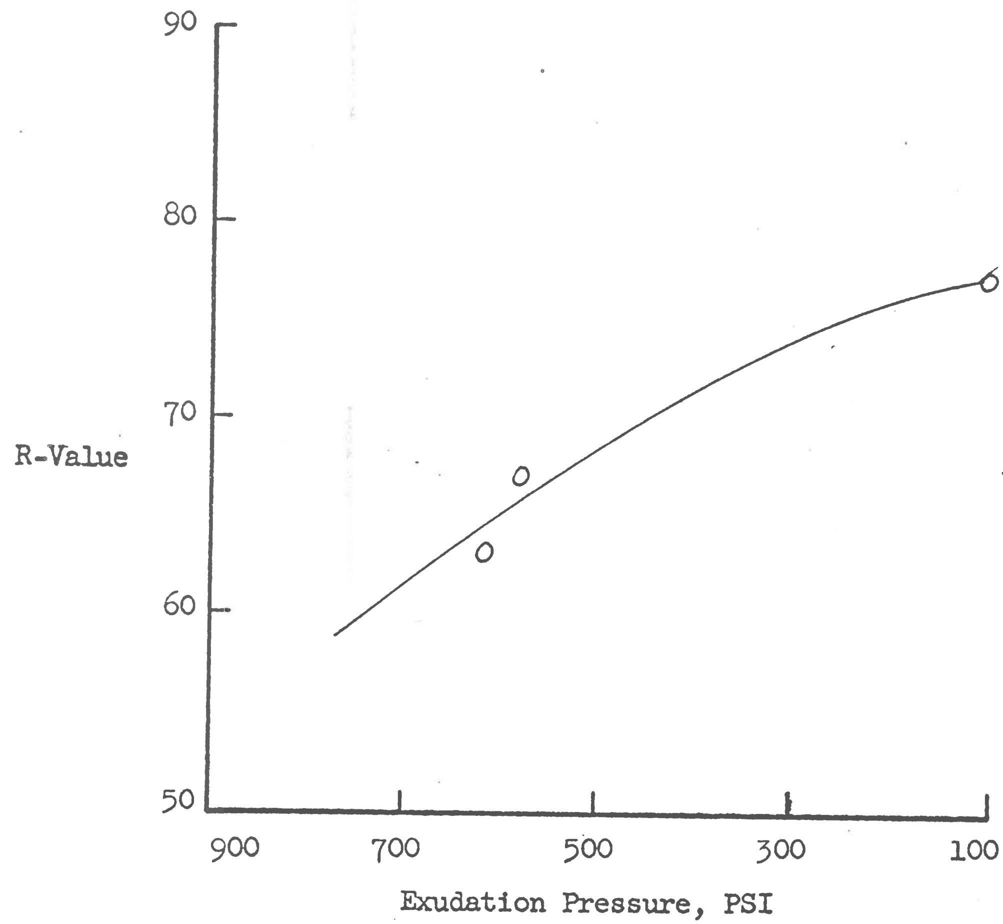
R-Value at 240 PSI: 76
R-Value at 300 PSI: 76



Summary of Data
California R-Value

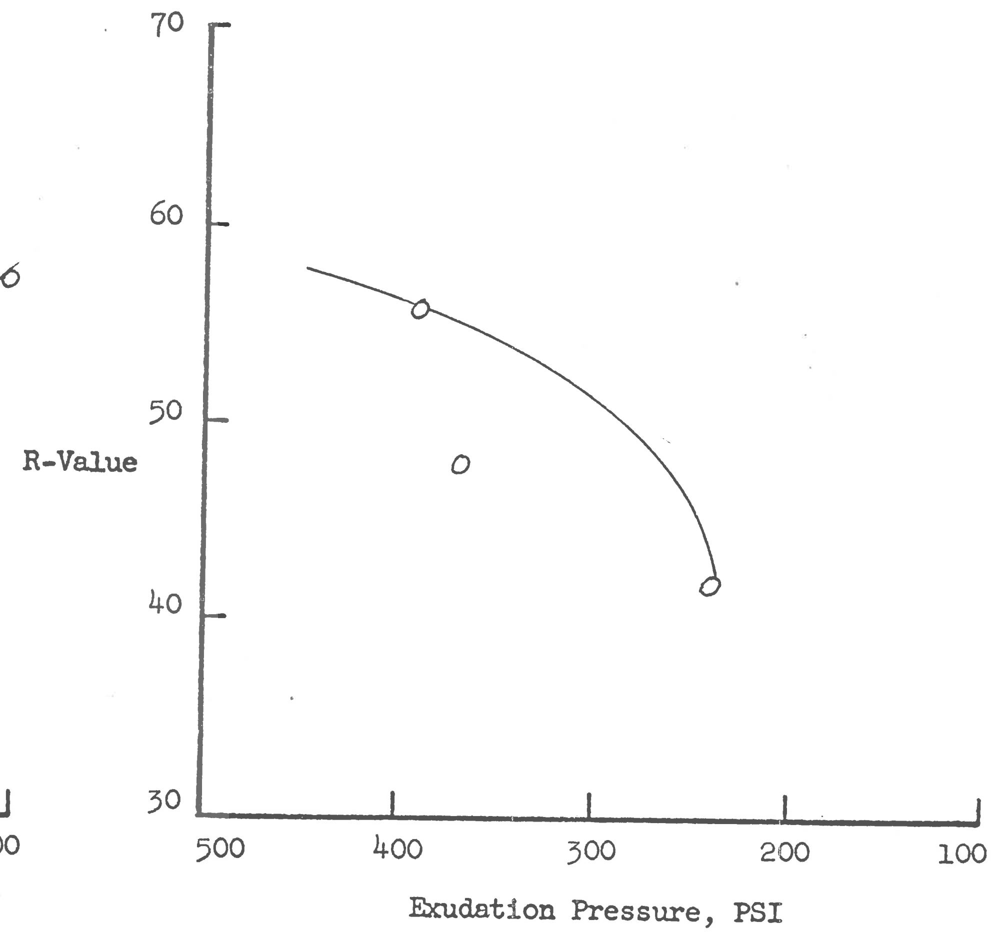
Sample No.: 409
Date Tested: 2-20-68
Visual Description: Red Sand

R-Value at 240 PSI: 75
R-Value at 300 PSI: 73



Sample No.: 410
Date Tested: 2-20-68
Visual Description: Sand

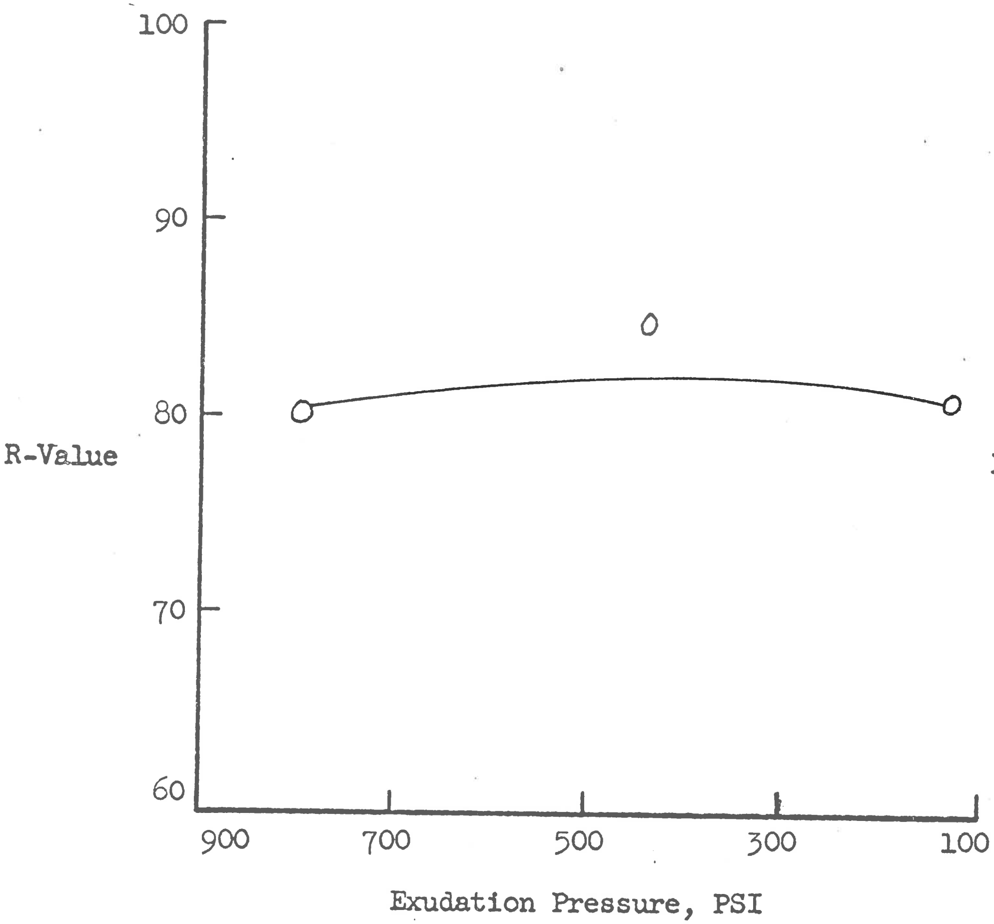
R-Value at 240 PSI: 51
R-Value at 300 PSI: 52



Summary of Data
California R-Value

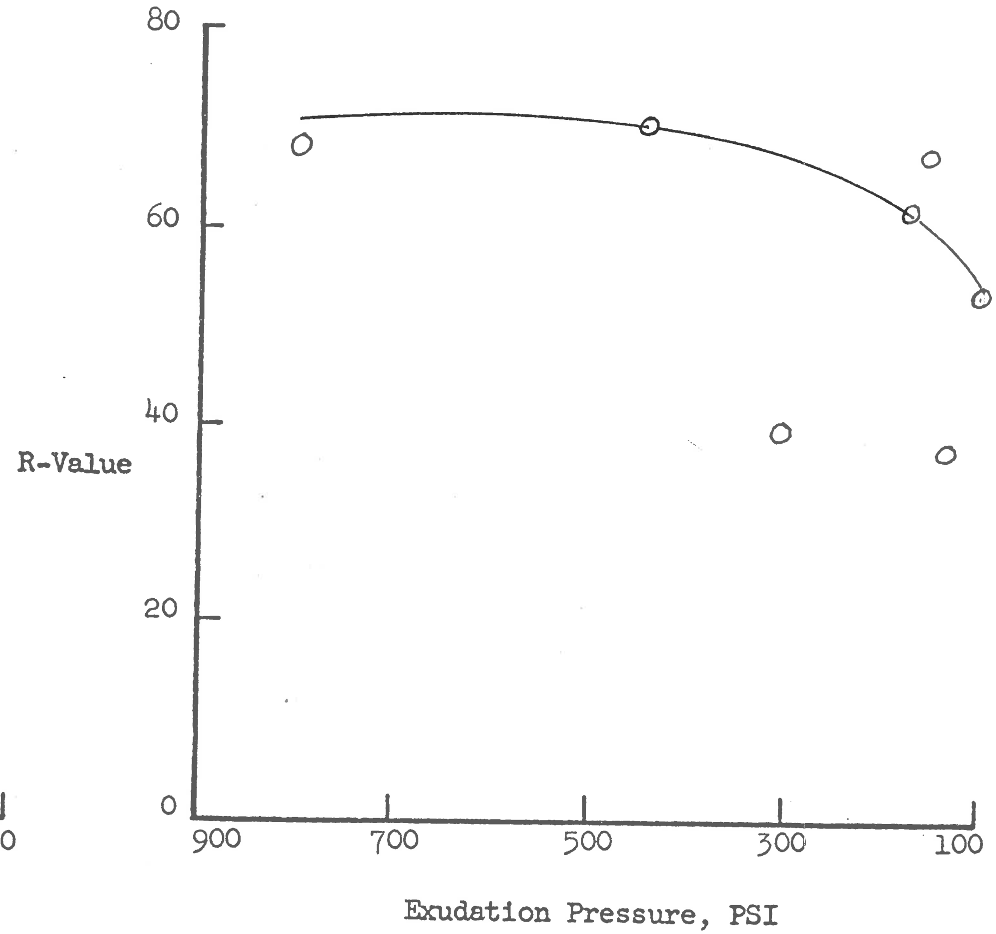
Sample No.: 411
Date Tested: 2-26-68
Visual Description: Sand and Gravel

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



Sample No.: 412
Date Tested: 2-21-68
Visual Description: Loess

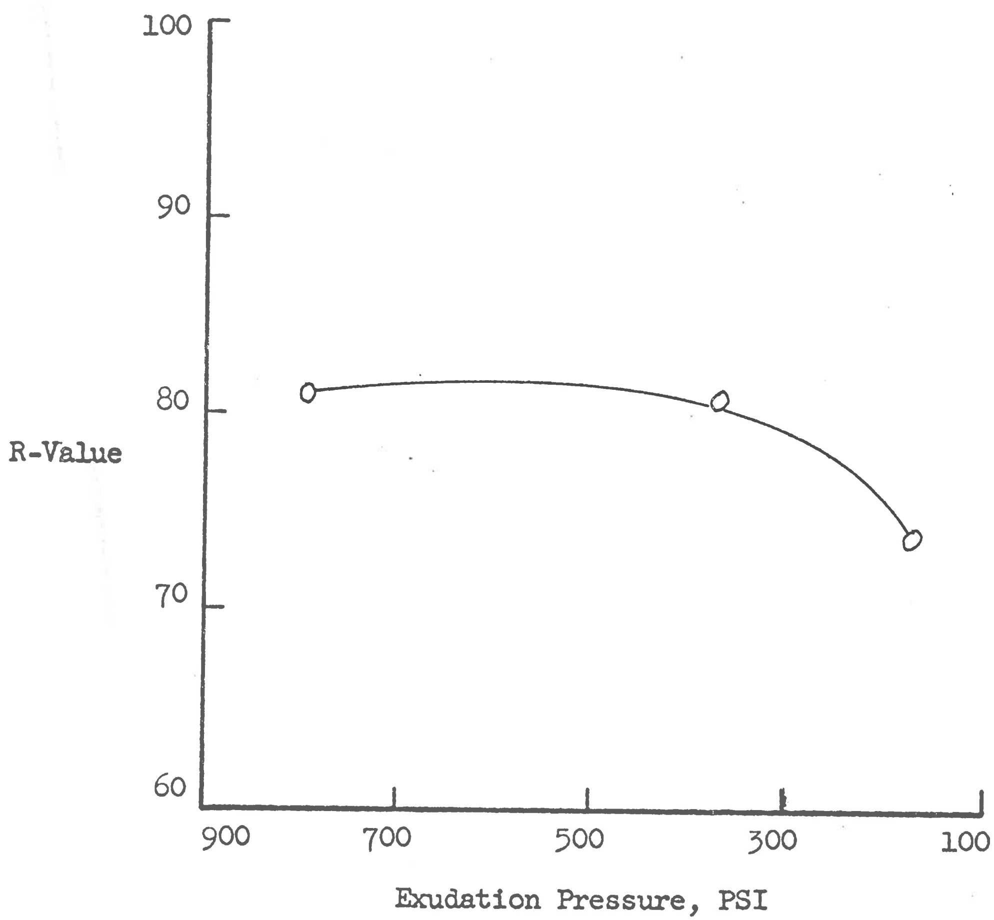
R-Value at 240 PSI: 66
R-Value at 300 PSI: 68



Summary of Data
California R-Value

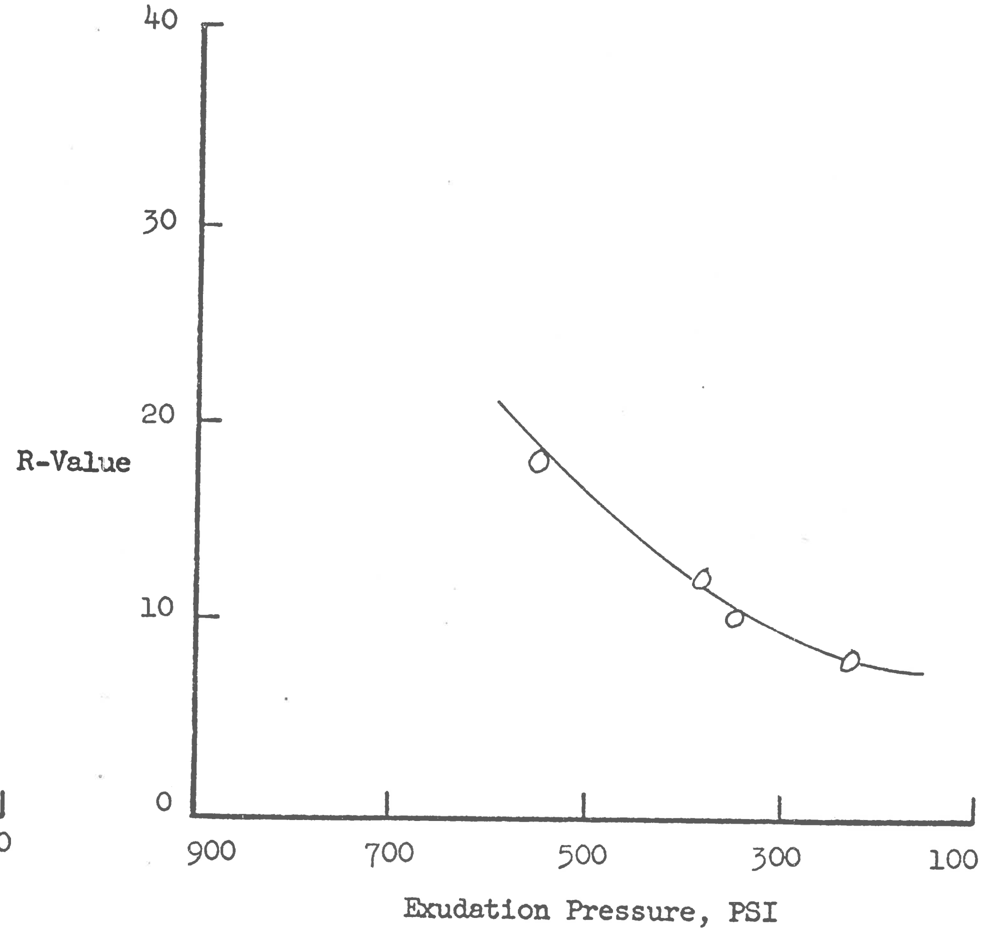
Sample No.: 413
Date Tested: 2-26-68
Visual Description: Silty Sand with Gravel

R-Value at 240 PSI: 78
R-Value at 300 PSI: 79



Sample No.: 414
Date Tested: 2-21-68
Visual Description: Yellow Clay

R-Value at 240 PSI: 8
R-Value at 300 PSI: 10



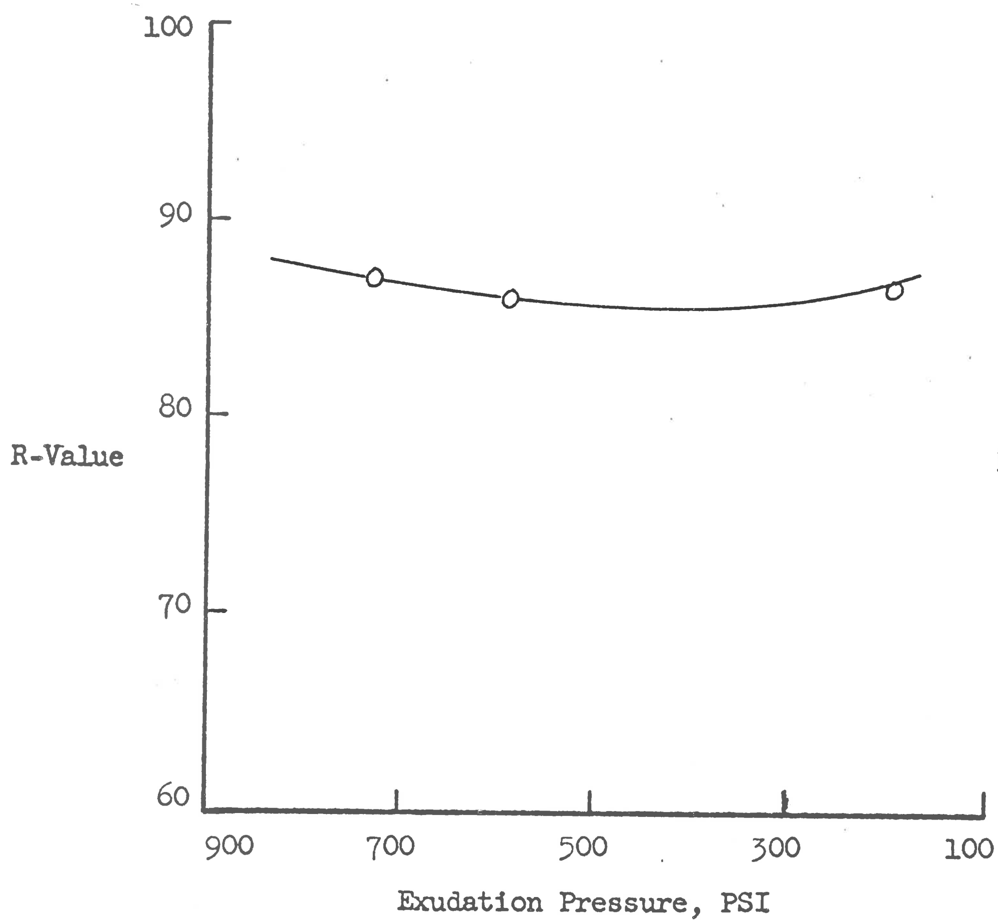
Summary of Data
California R-Value

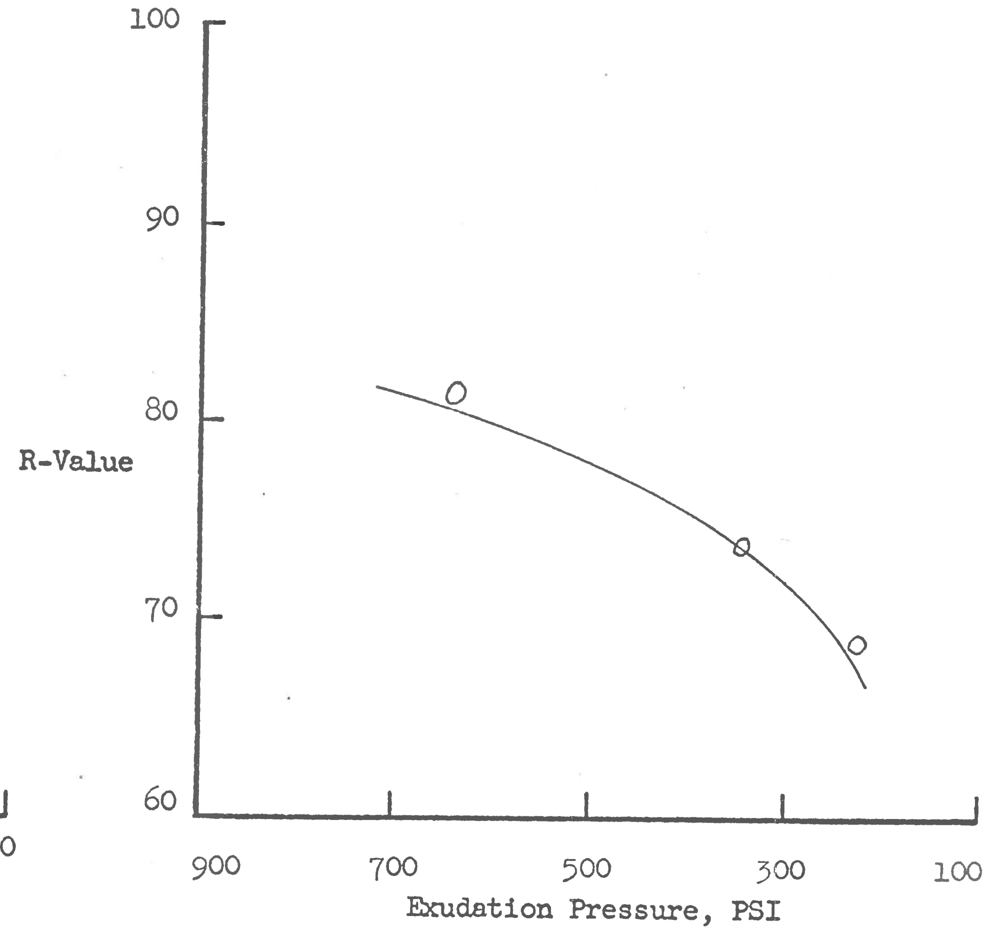
Sample No.: 415
Date Tested: 2-26-68
Visual Description: Stone Fines

R-Value at 240 PSI: 86
R-Value at 300 PSI: 86

Sample No.: 416
Date Tested: 2-21-68
Visual Description: Silty Sand

R-Value at 240 PSI: 69
R-Value at 300 PSI: 72

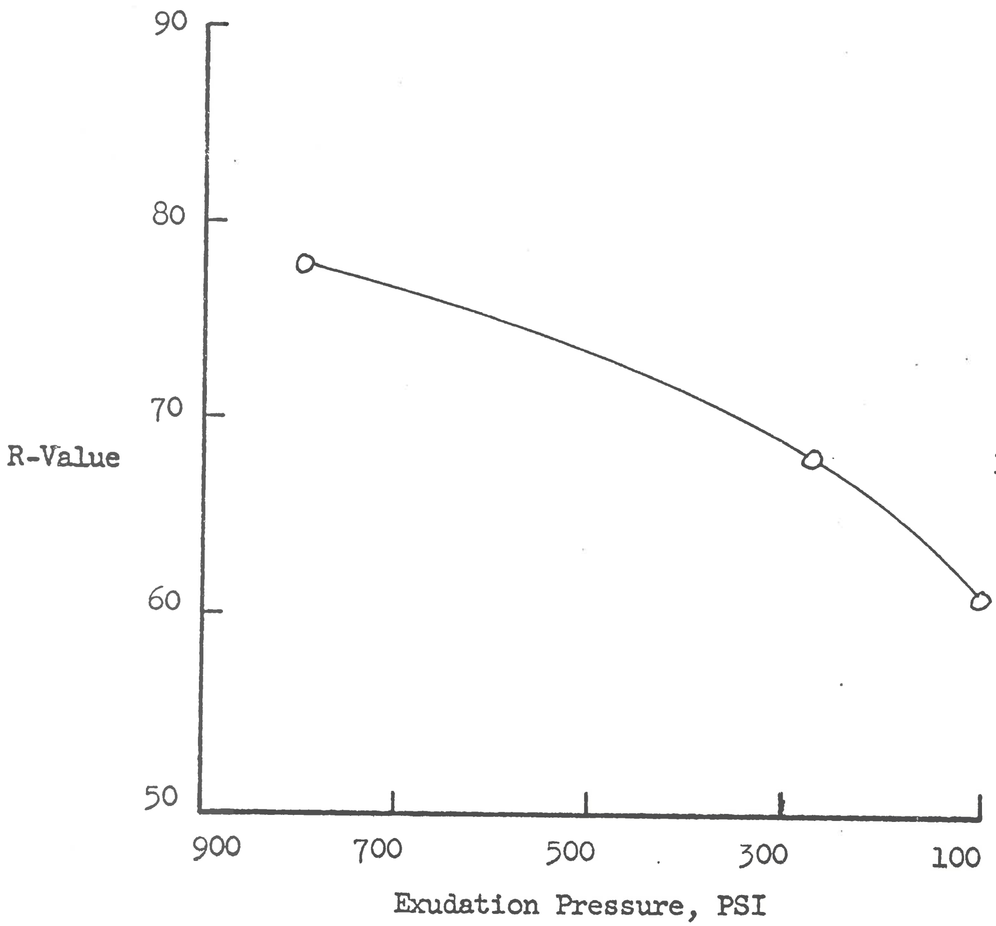




Summary of Data
California R-Value

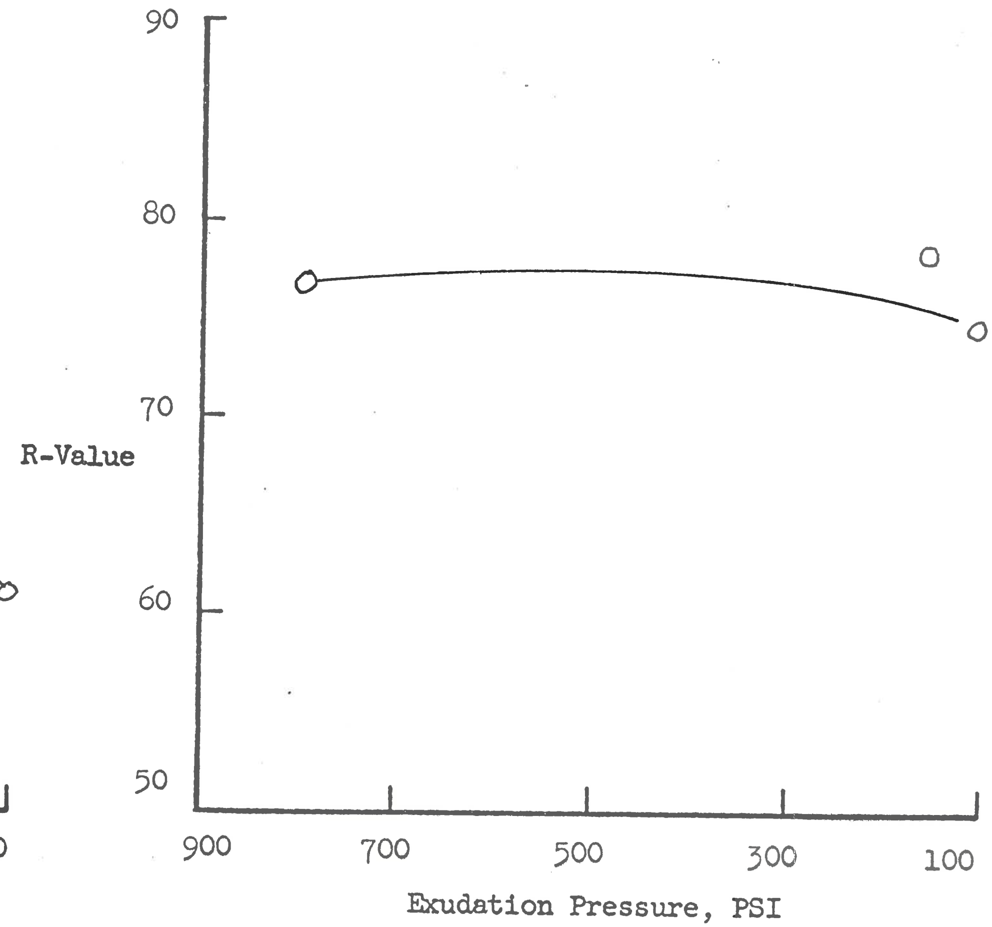
Sample No.: 417
Date Tested: 2-20-68
Visual Description: Silty Sand

R-Value at 240 PSI: 67
R-Value at 300 PSI: 69



Sample No.: 418
Date Tested: 2-20-68
Visual Description: Gravel and Sand

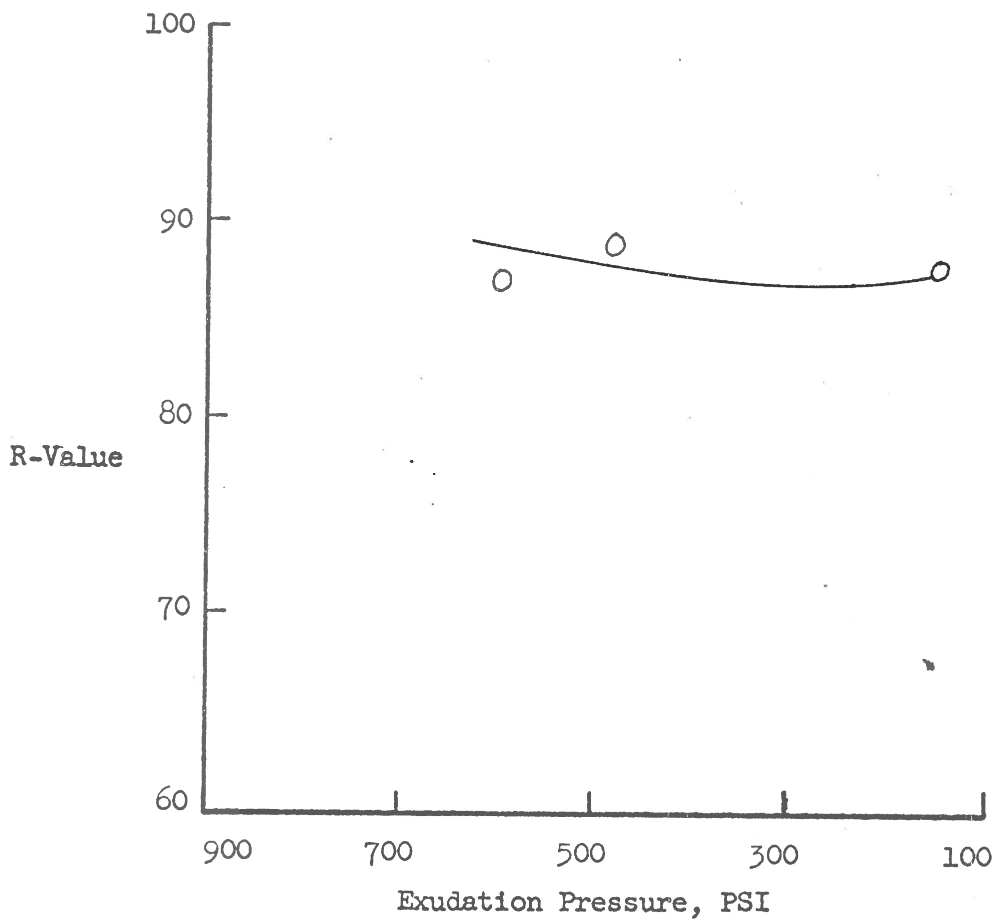
R-Value at 240 PSI: 77
R-Value at 300 PSI: 77



Summary of Data
California R-Value

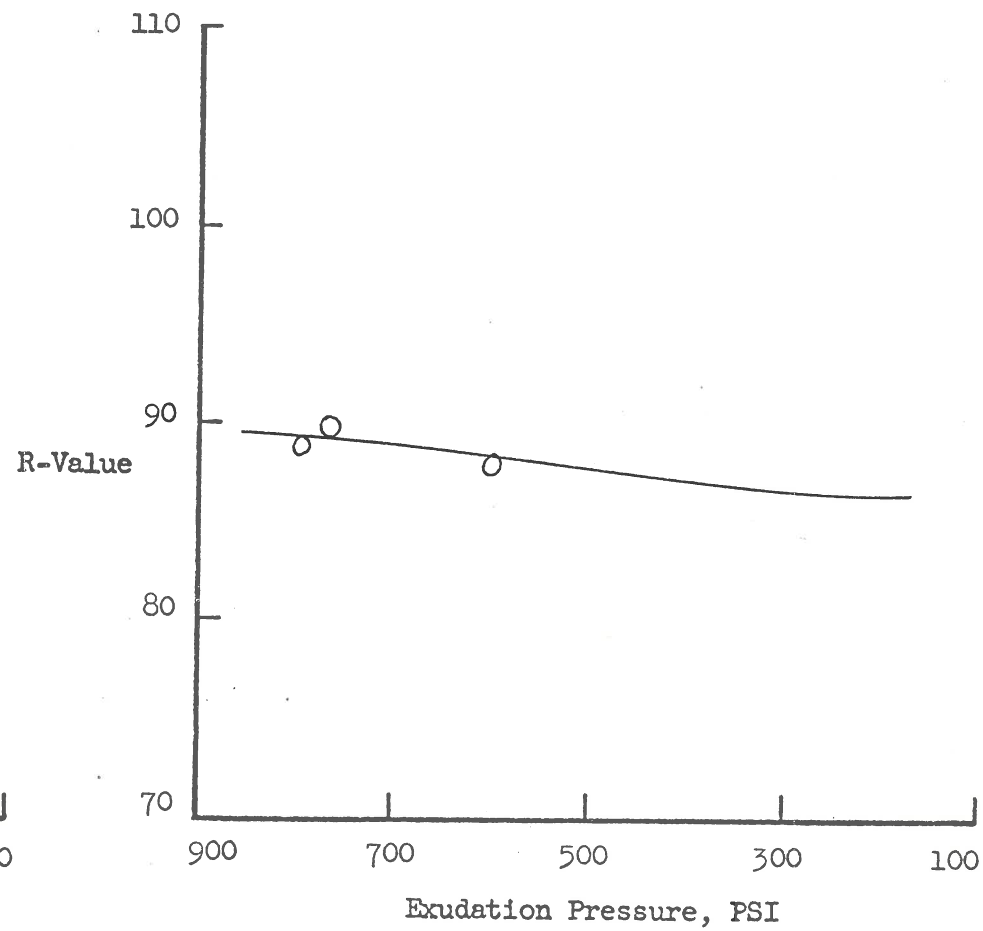
Sample No.: 419
Date Tested: 2-26-68
Visual Description: Stone Fines

R-Value at 240 PSI: 87
R-Value at 300 PSI: 87



Sample No.: 420
Date Tested: 2-26-68
Visual Description: Stone Fines

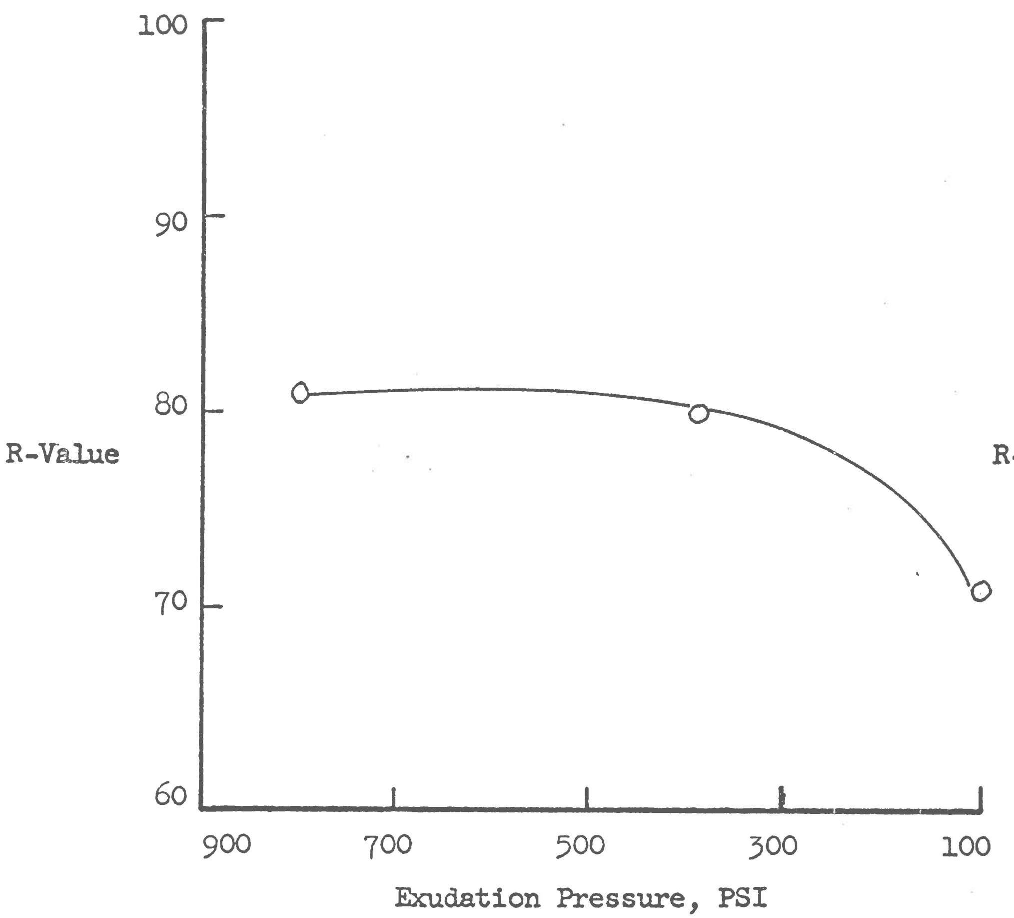
R-Value at 240 PSI: 87
R-Value at 300 PSI: 87



Summary of Data
California R-Value

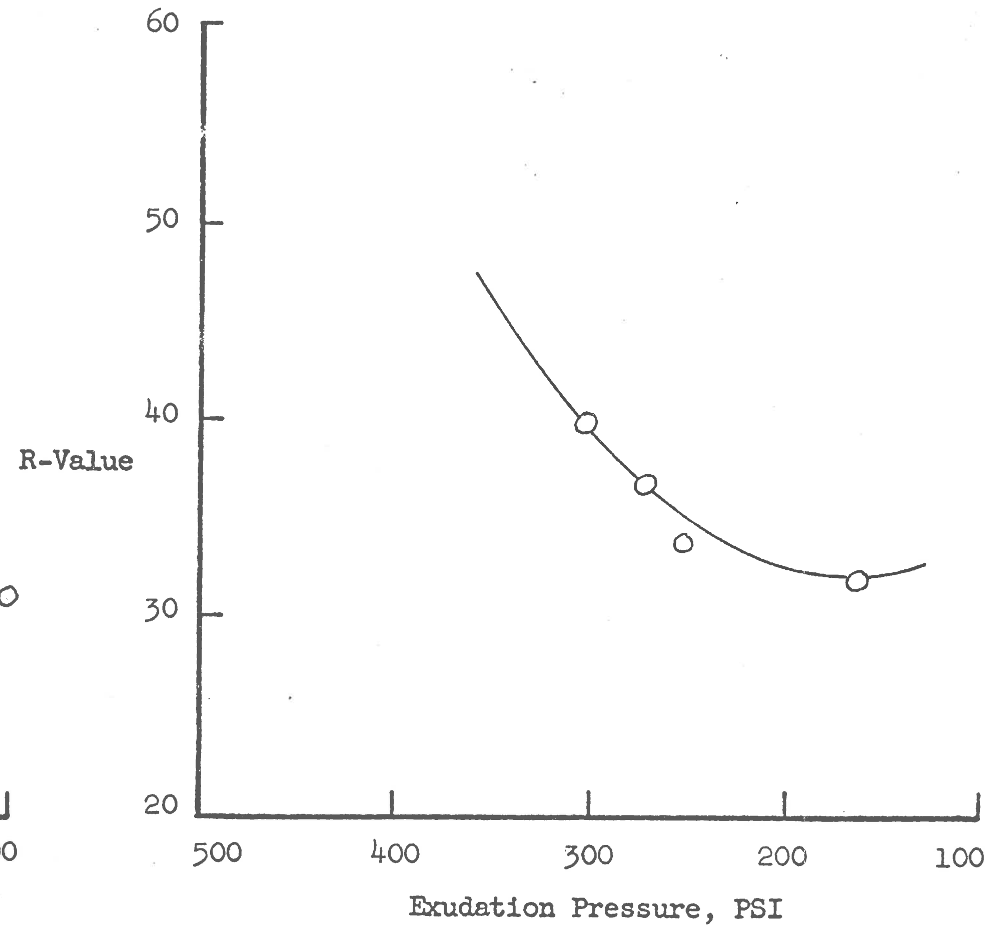
Sample No.: 421
Date Tested: 2-20-68
Visual Description: Silty Sand

R-Value at 240 PSI: 78
R-Value at 300 PSI: 79



Sample No.: 422
Date Tested: 2-20-68
Visual Description: Tan Silt

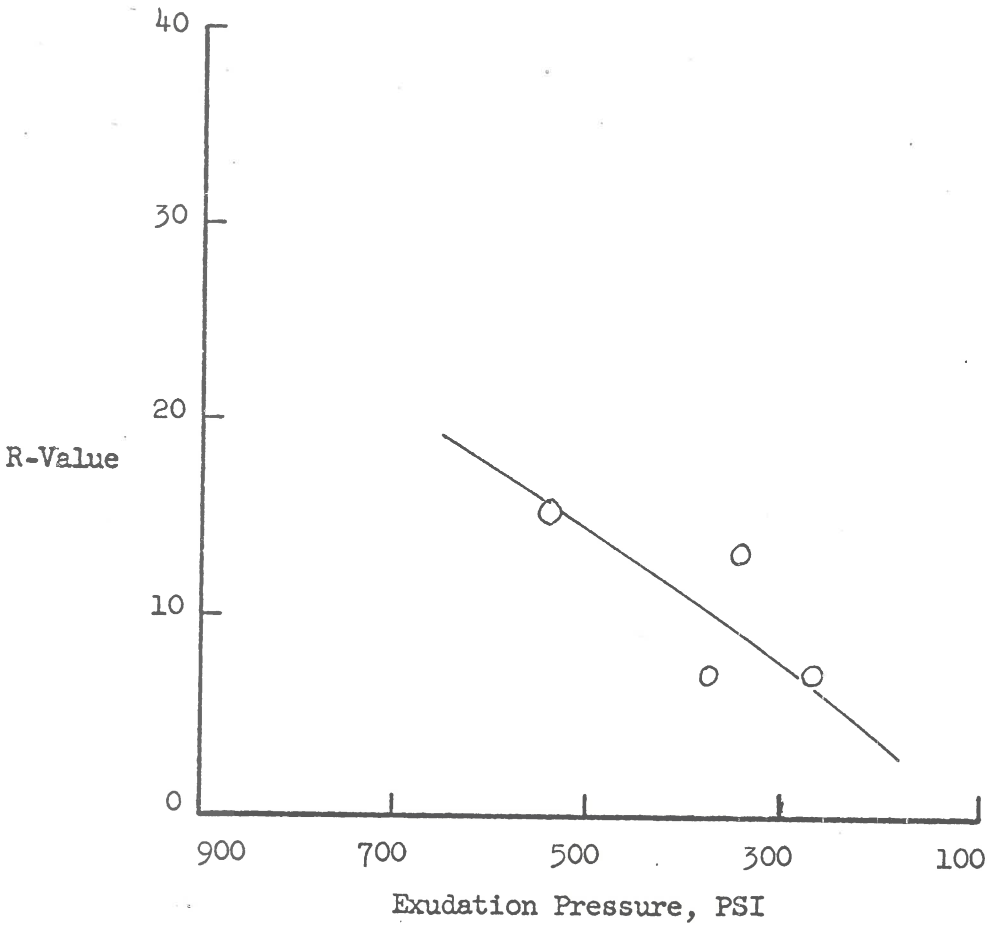
R-Value at 240 PSI: 35
R-Value at 300 PSI: 40



Summary of Data
California R-Value

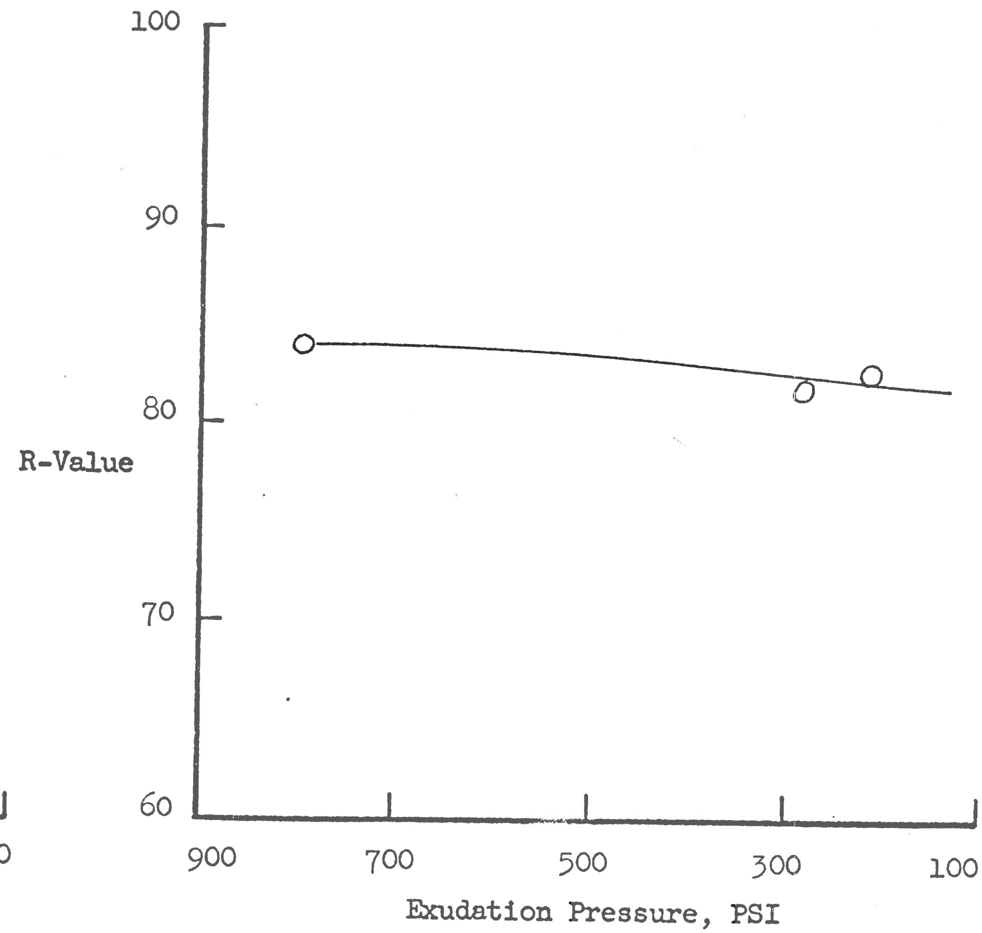
Sample No.: 423
Date Tested: 2-21-68
Visual Description: Organic Clay

R-Value at 240 PSI: 05
R-Value at 300 PSI: 08



Sample No.: 424
Date Tested: 2-20-68
Visual Description: Gravel and Red Sand

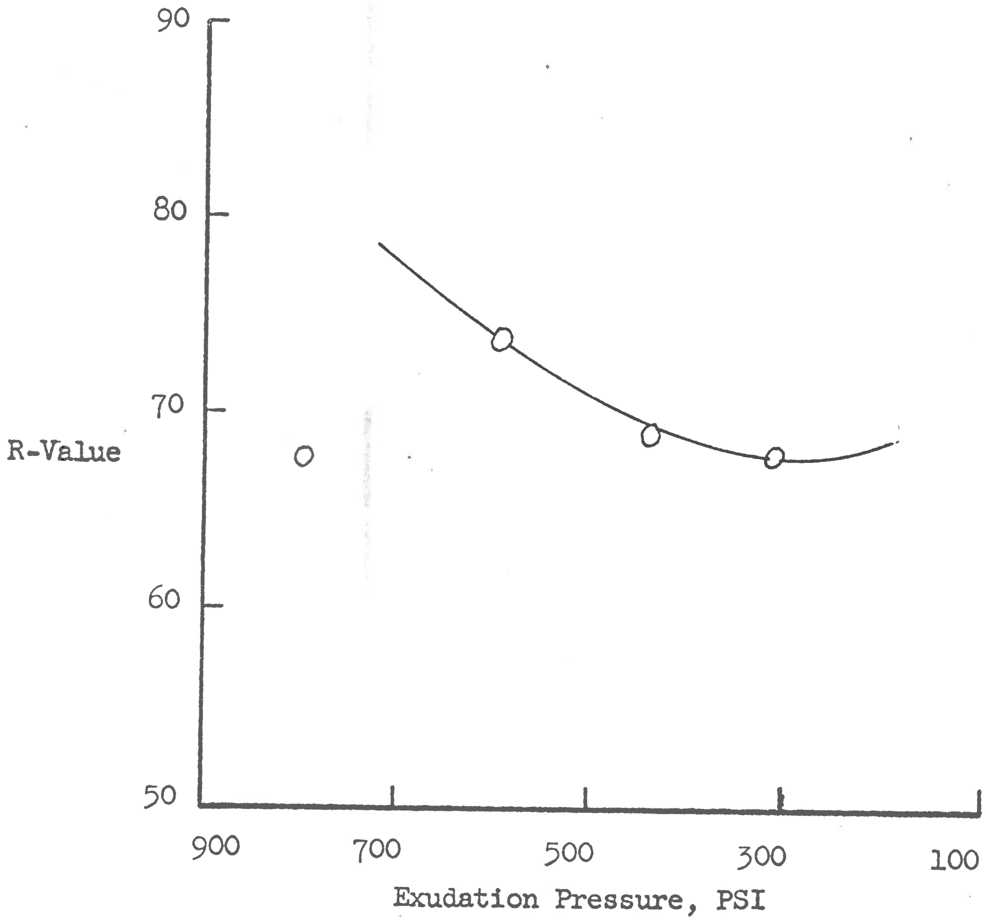
R-Value at 240 PSI: 82
R-Value at 300 PSI: 82



Summary of Data
California R-Value

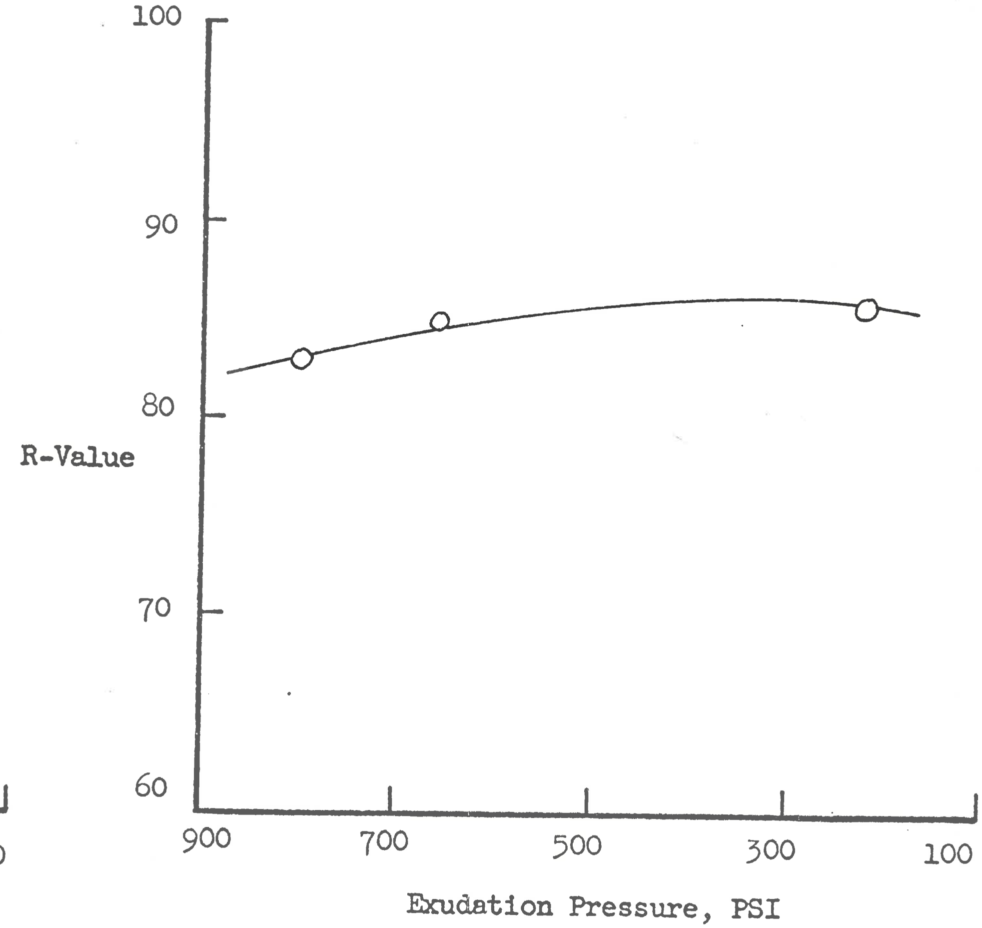
Sample No.: 425
Date Tested: 2-20-68
Visual Description: Sand

R-Value at 240 PSI: 68
R-Value at 300 PSI: 68



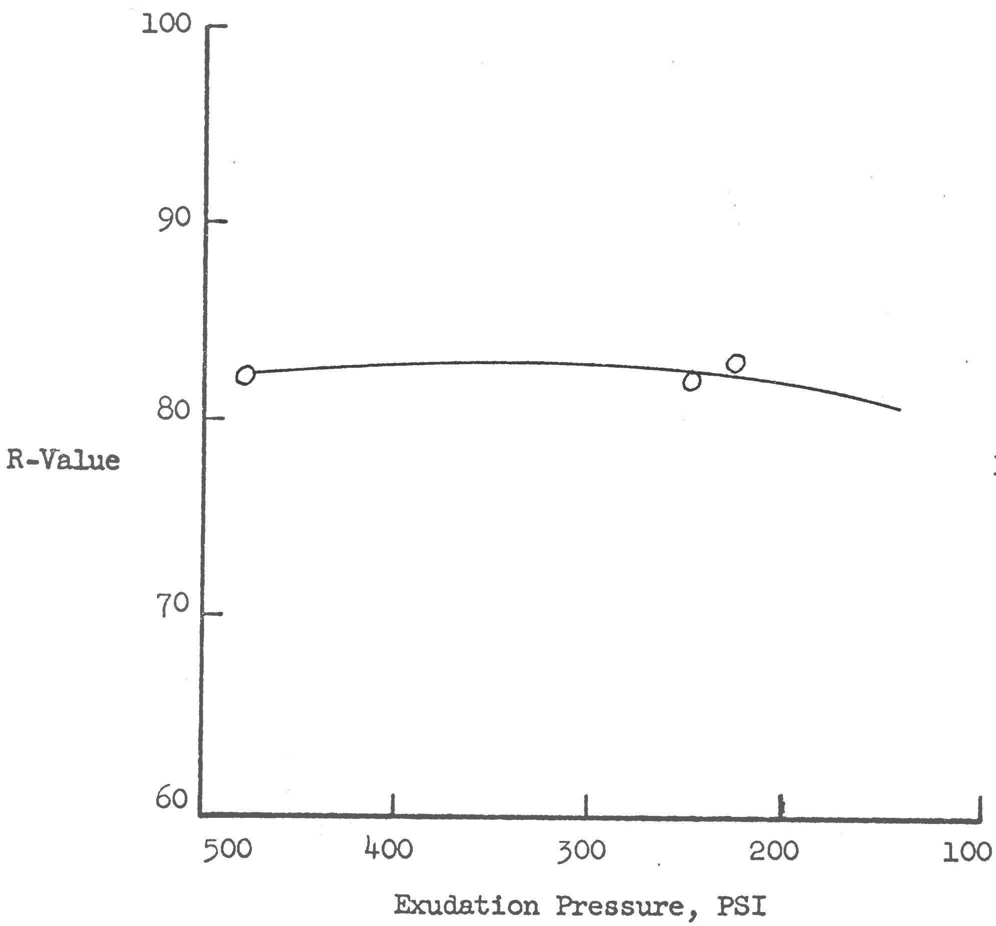
Sample No.: 426
Date Tested: 2-26-68
Visual Description: Sand

R-Value at 240 PSI: 85
R-Value at 300 PSI: 85

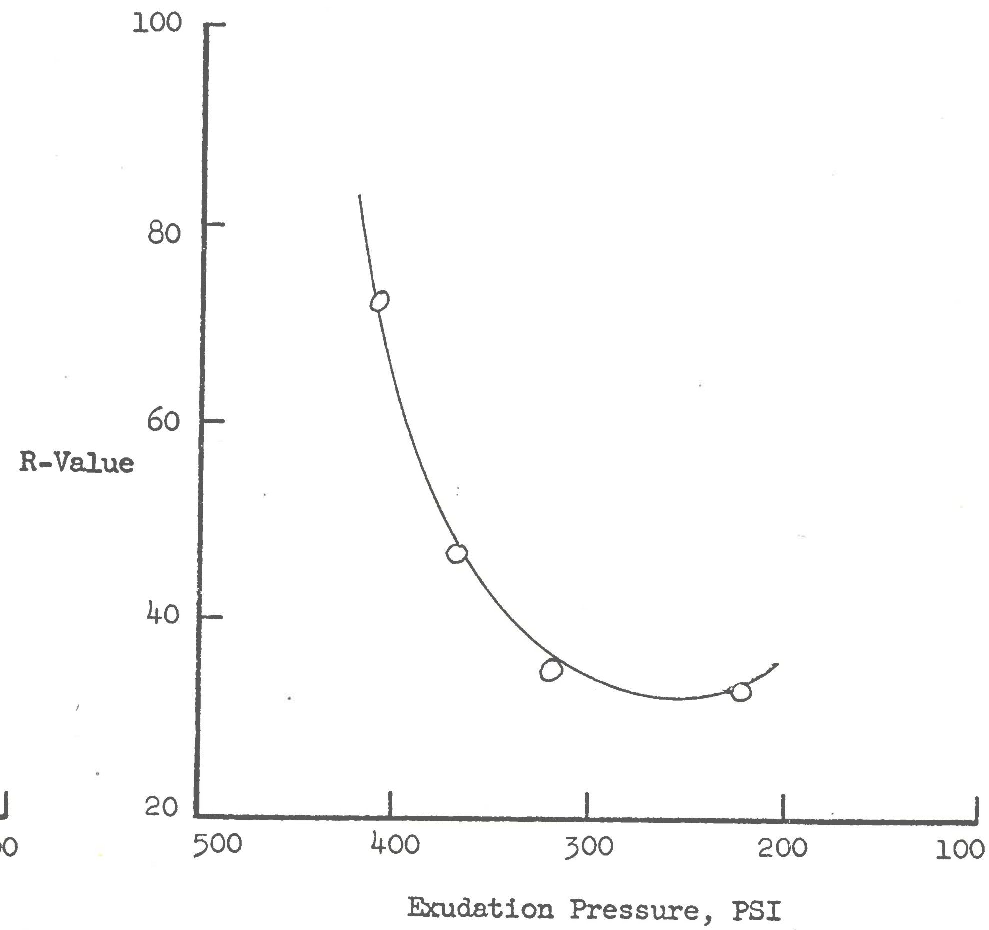


Summary of Data
California R-Value

Sample No.:	427
Date Tested:	2-20-68
Visual Description:	Gravel and Sand
R-Value at 240 PSI:	82
R-Value at 300 PSI:	83



Sample No.:	430
Date Tested:	2-20-68
Visual Description:	Black Silty Sand
R-Value at 240 PSI:	33
R-Value at 300 PSI:	37



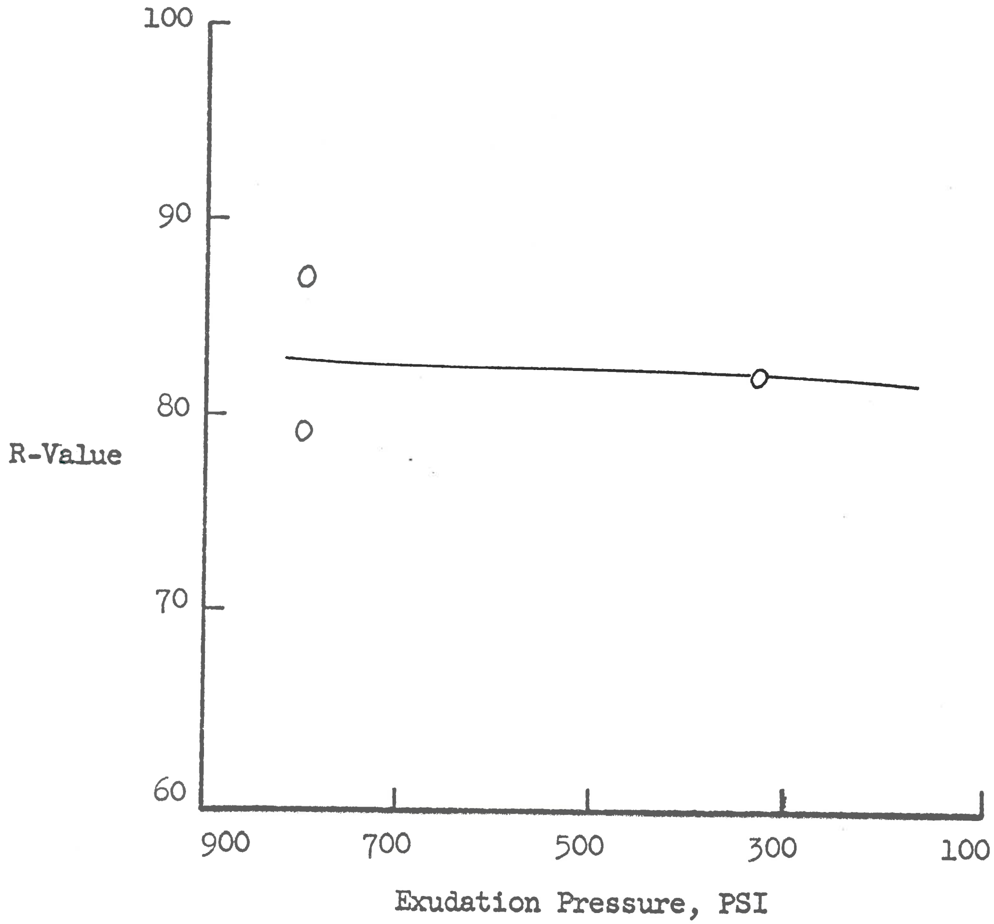
Summary of Data
California R-Value

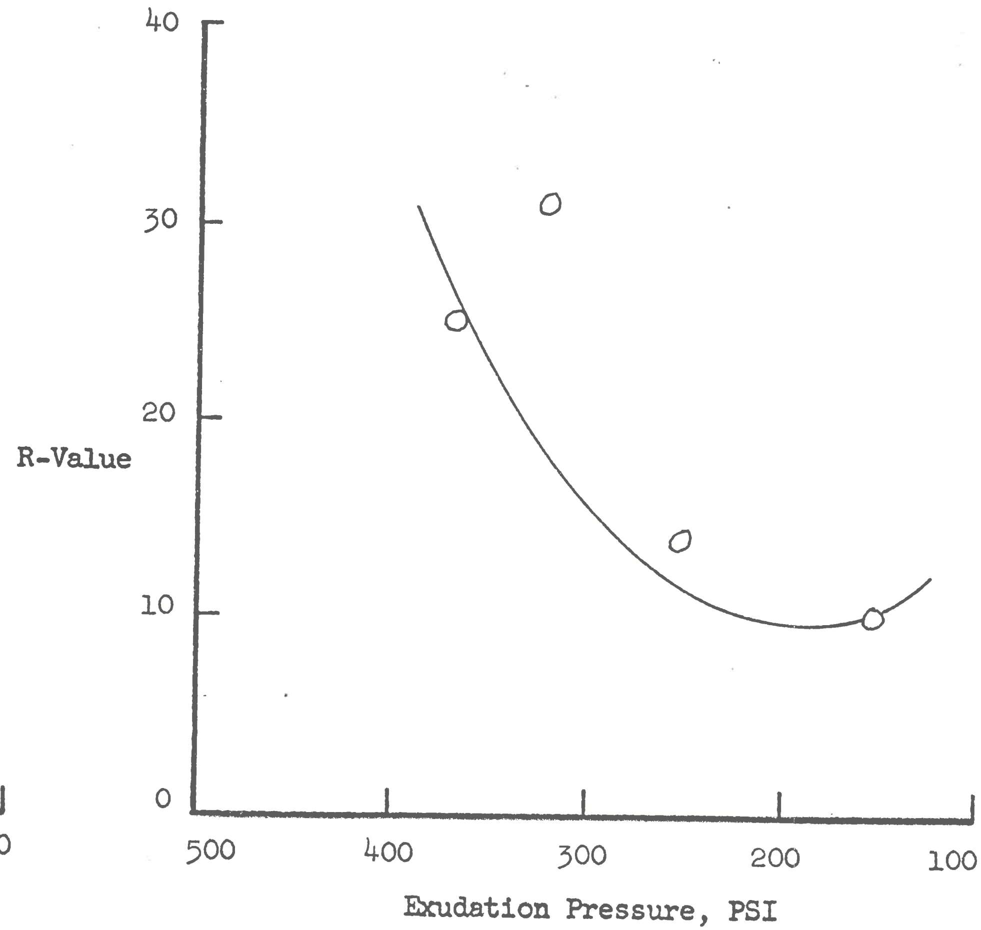
Sample No.: 431
Date Tested: 2-20-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 82
R-Value at 300 PSI: 82

Sample No.: 432
Date Tested: 2-21-68
Visual Description: Sand

R-Value at 240 PSI: 11
R-Value at 300 PSI: 15

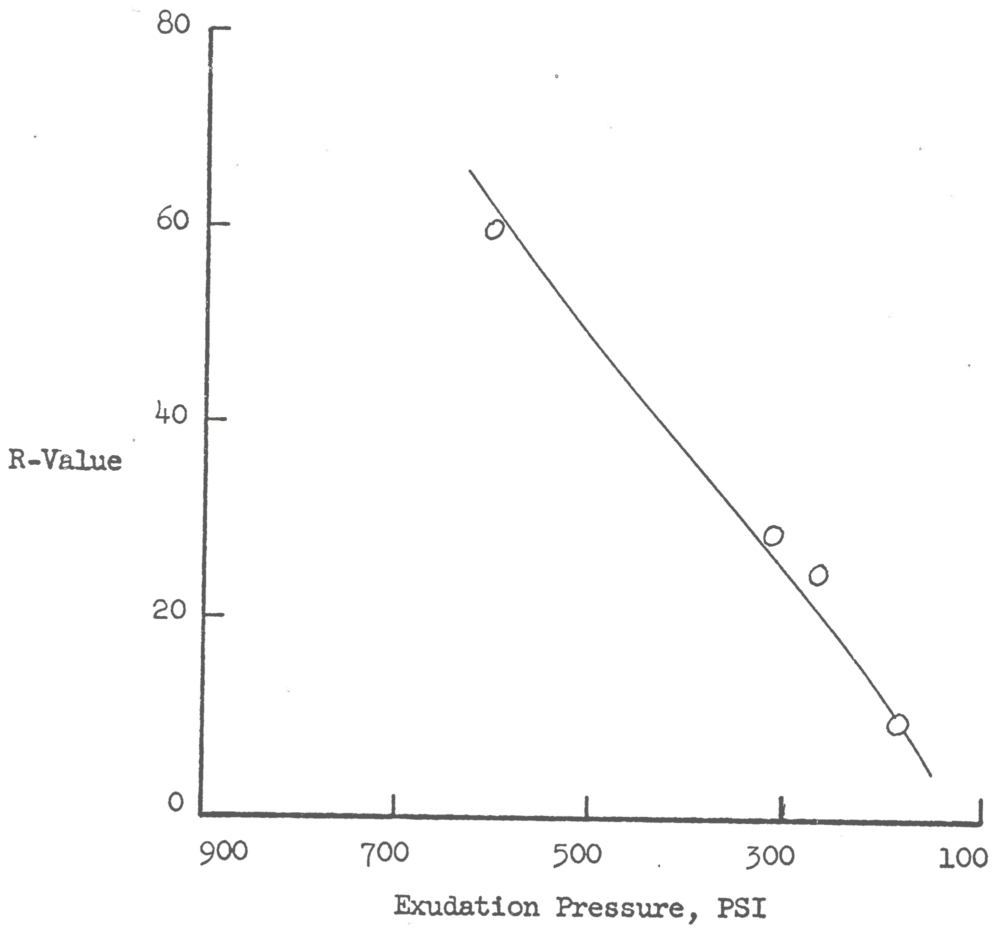




Summary of Data
California R-Value

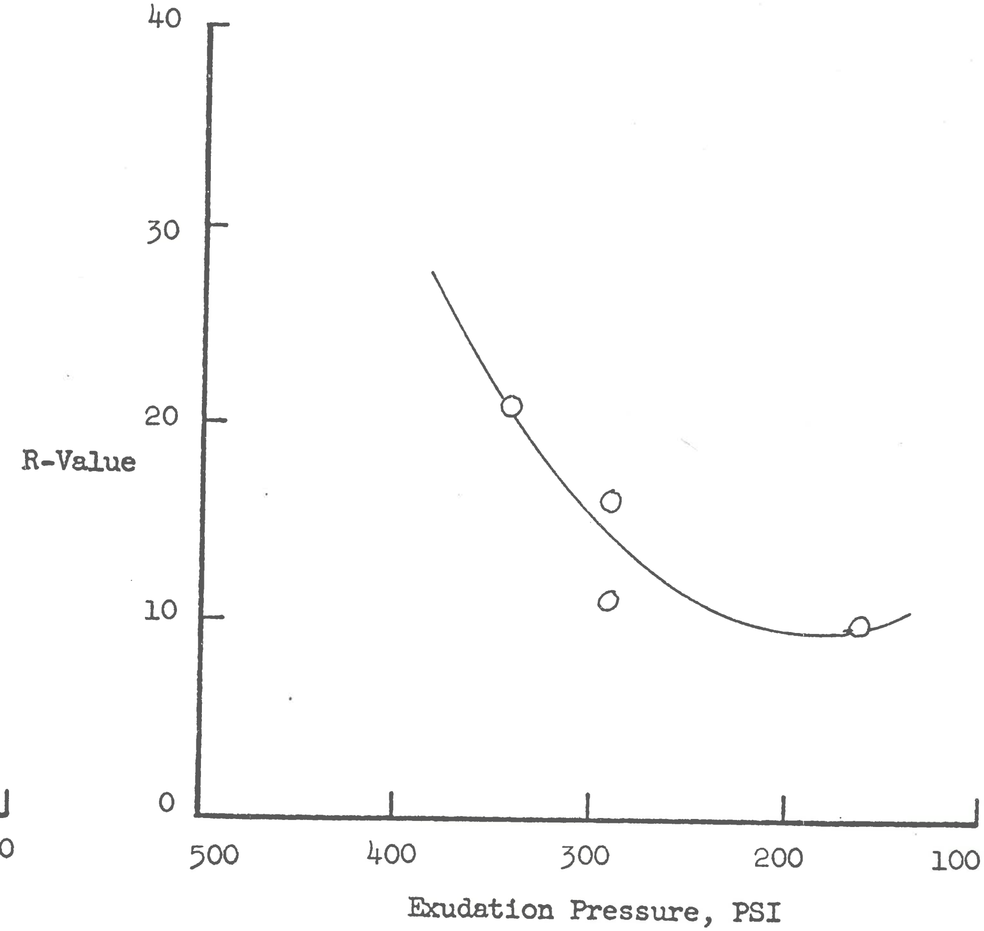
Sample No.: 433
Date Tested: 2-20-68
Visual Description: Black Clay

R-Value at 240 PSI: 19
R-Value at 300 PSI: 28



Sample No.: 435
Date Tested: 2-20-68
Visual Description: Black Clay

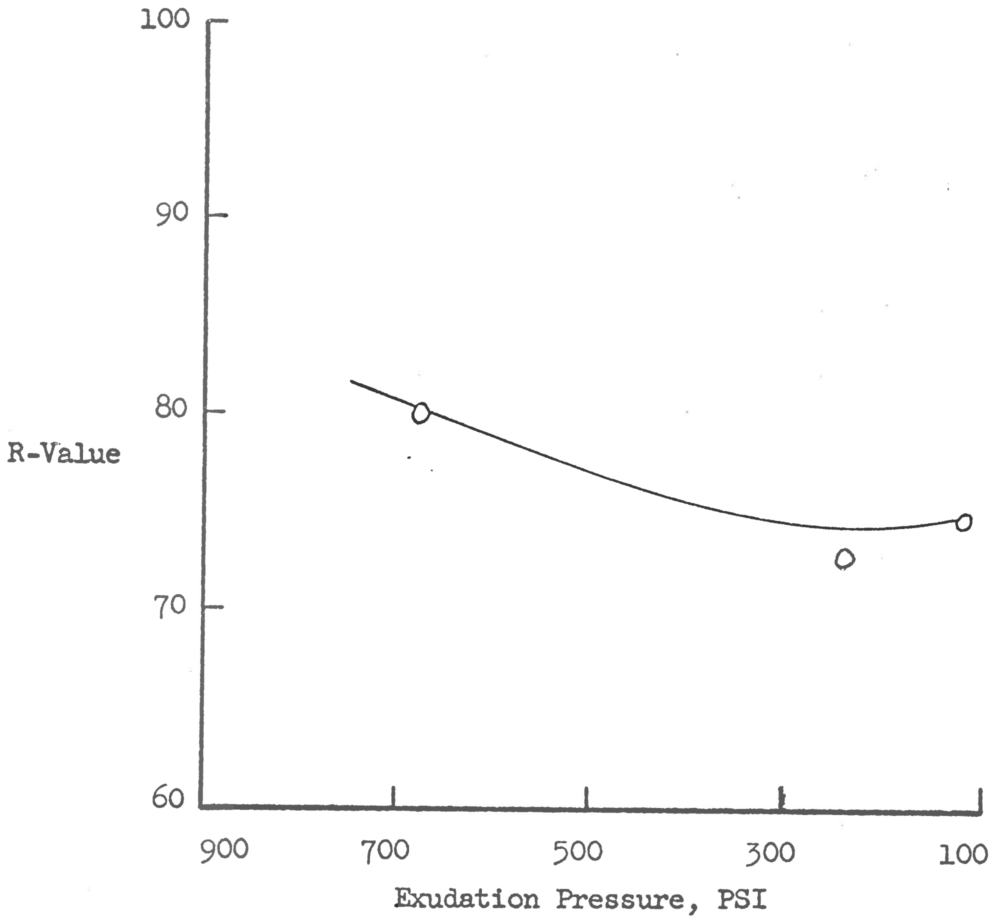
R-Value at 240 PSI: 11
R-Value at 300 PSI: 15



Summary of Data
California R-Value

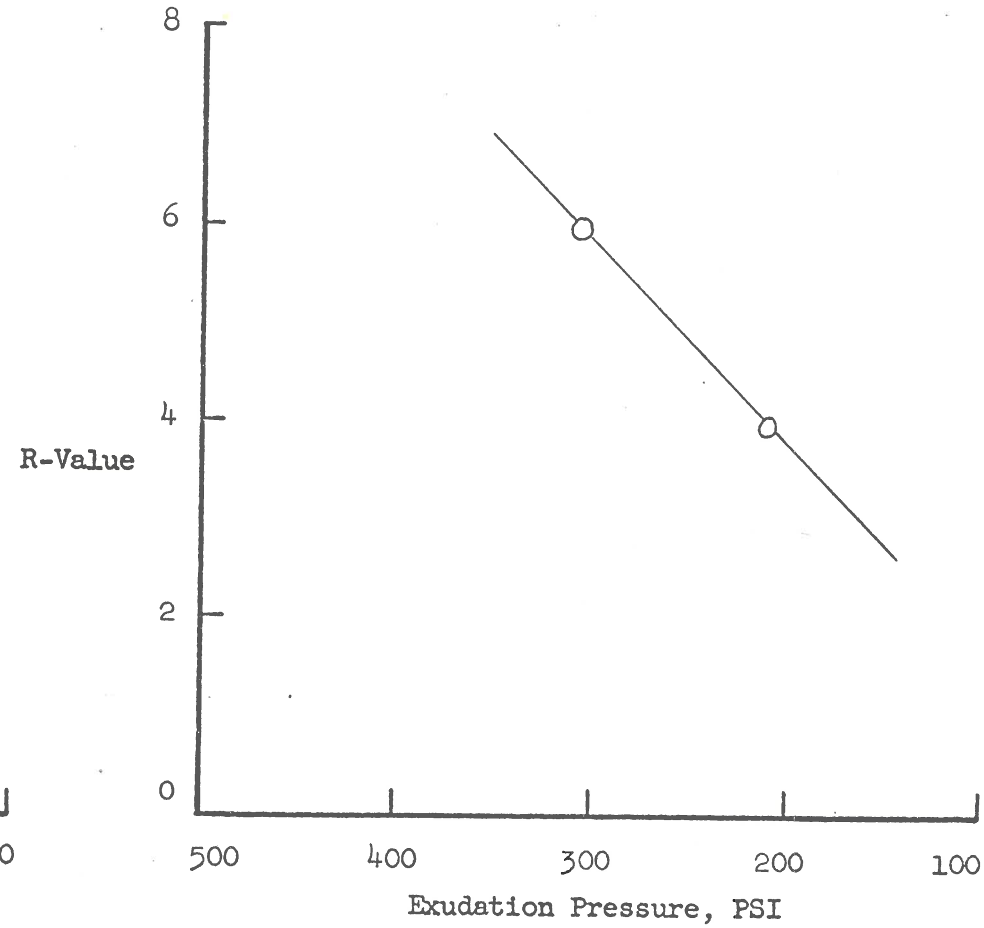
Sample No.: 501
Date Tested: 2-20-68
Visual Description: Sandy Clay with Gravel

R-Value at 240 PSI: 75
R-Value at 300 PSI: 75



Sample No.: 502
Date Tested: 2-20-68
Visual Description: Tan Clay

R-Value at 240 PSI: 5
R-Value at 300 PSI: 6



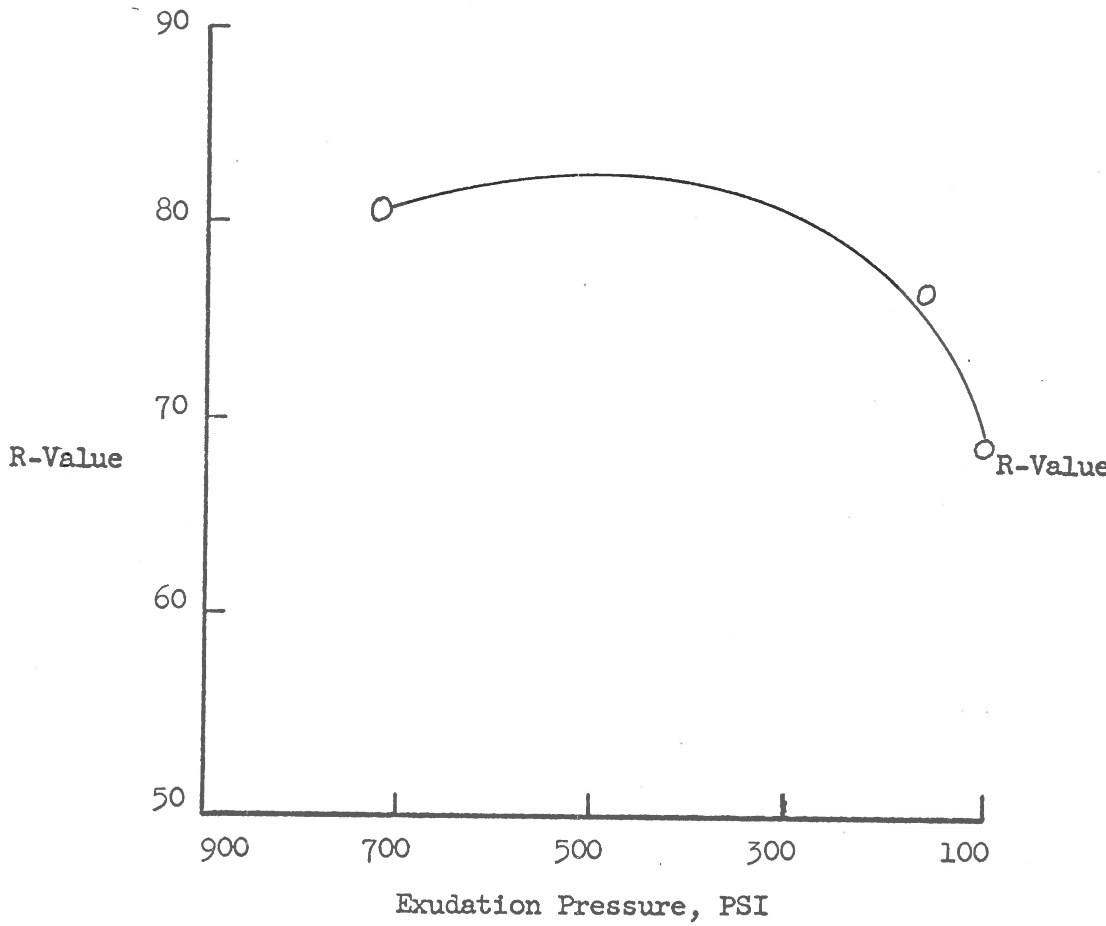
Summary of Data
California R-Value

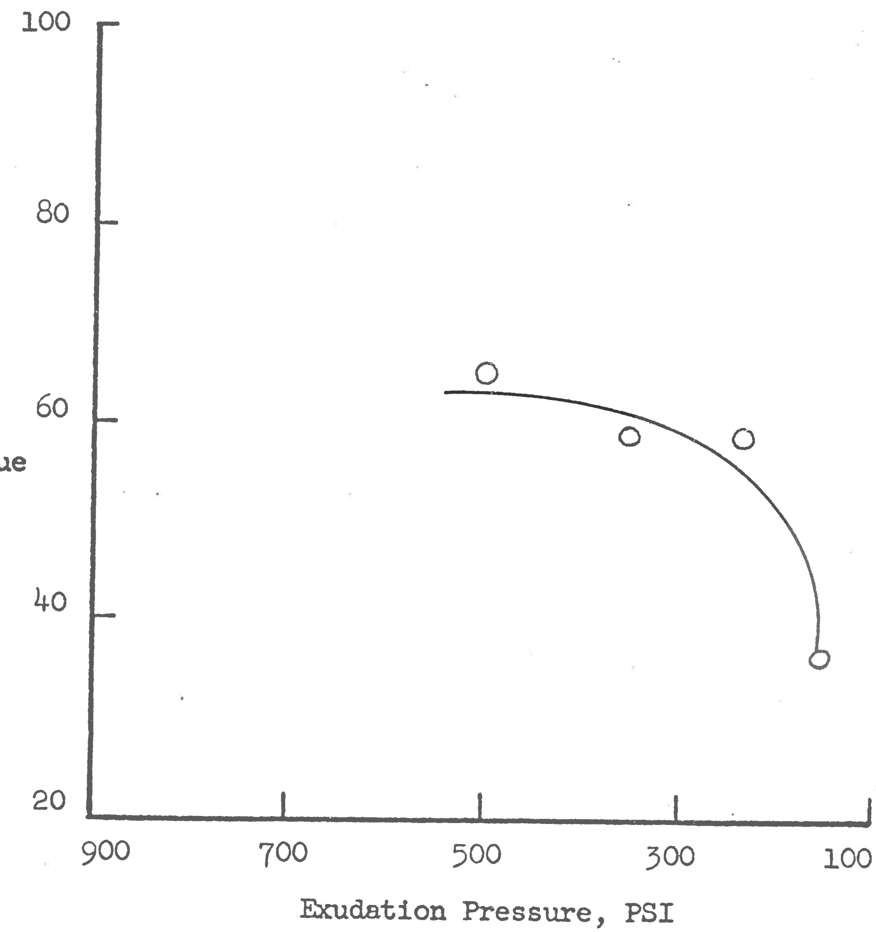
Sample No.: 503
Date Tested: 2-20-68
Visual Description: Sand

R-Value at 240 PSI: 80
R-Value at 300 PSI: 81

Sample No.: 504
Date Tested: 2-21-68
Visual Description: Silty Sand

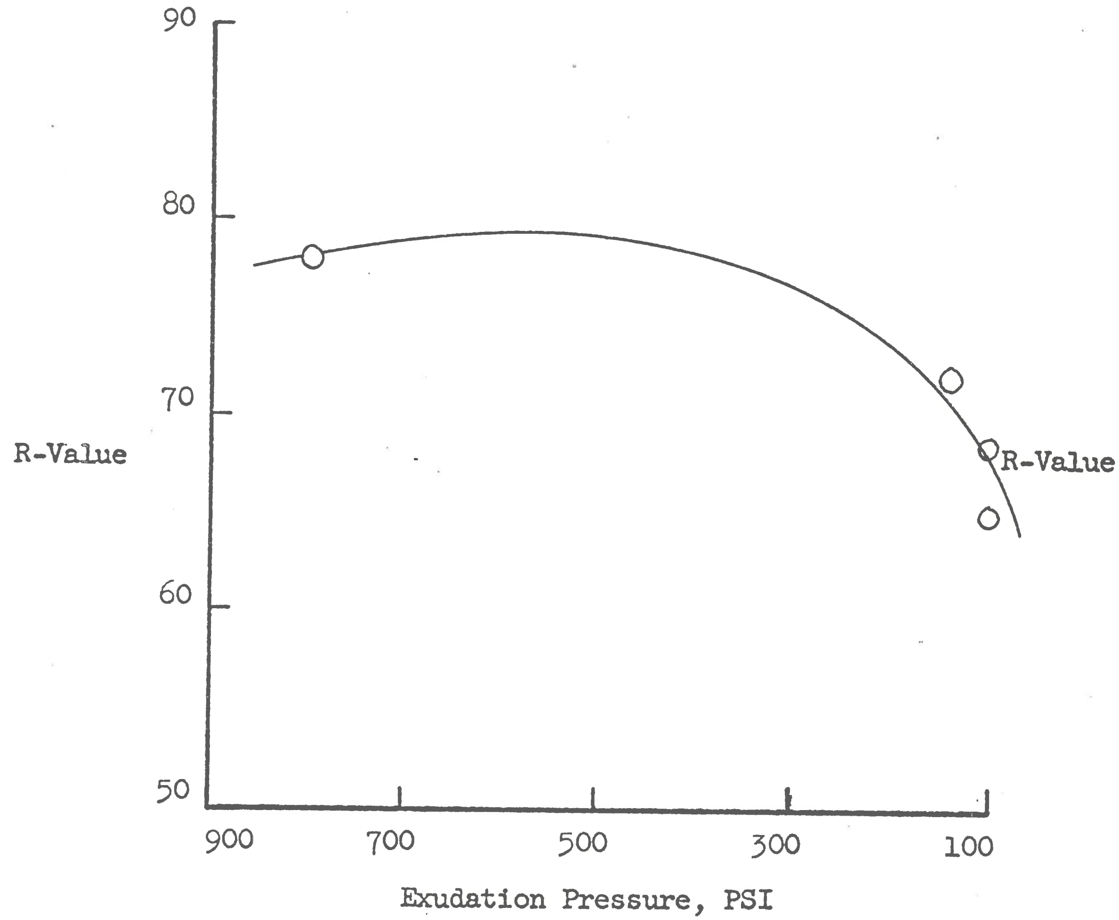
R-Value at 240 PSI: 60
R-Value at 300 PSI: 60



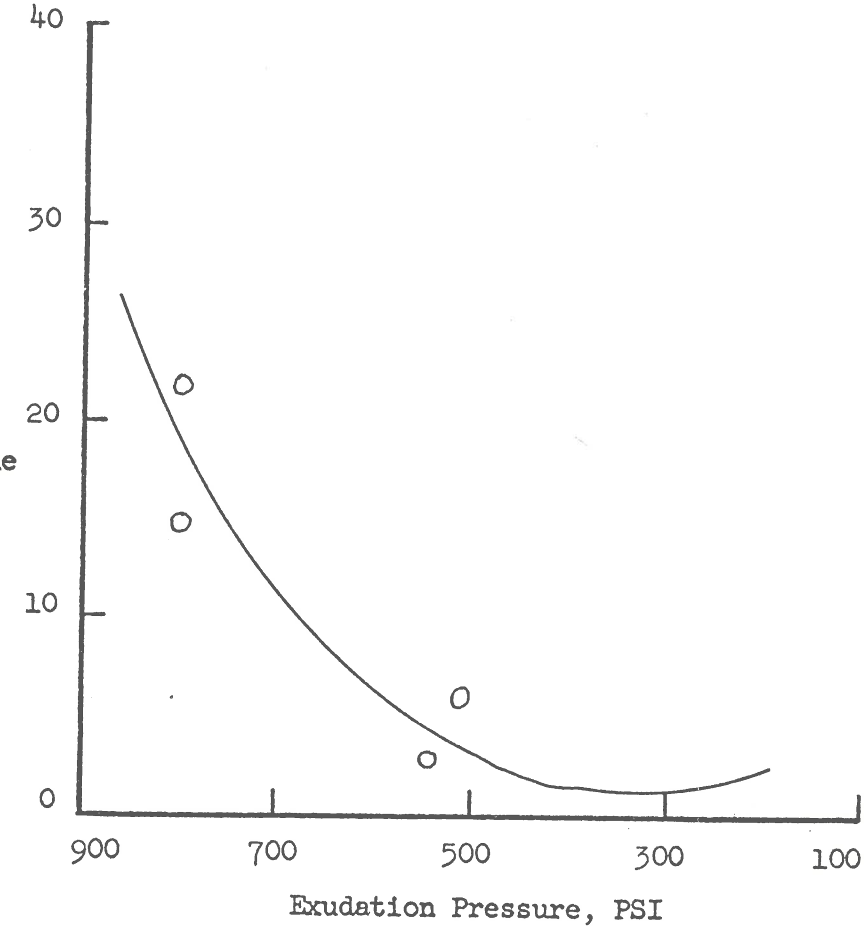


Summary of Data
California R-Value

Sample No.:	505
Date Tested:	2-21-68
Visual Description:	Sand
R-Value at 240 PSI:	75
R-Value at 300 PSI:	77



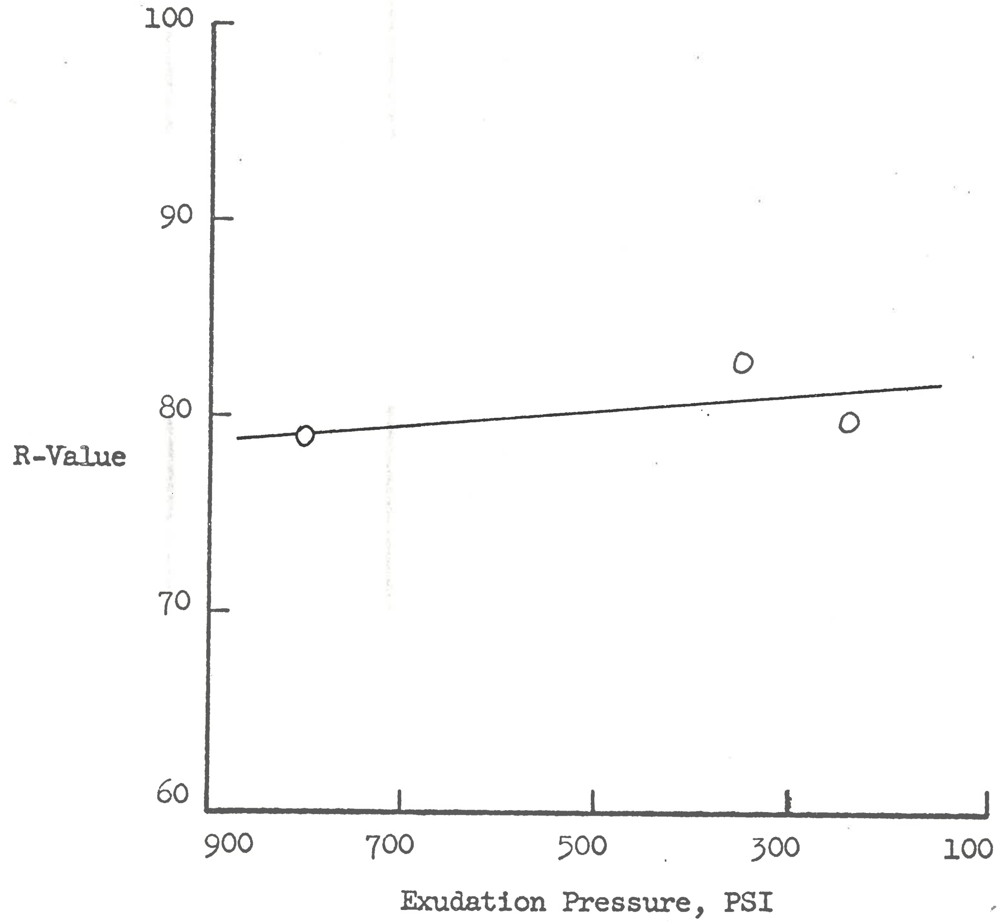
Sample No.:	506
Date Tested:	2-20-68
Visual Description:	Black Clay
R-Value at 240 PSI:	02
R-Value at 300 PSI:	03



Summary of Data
California R-Value

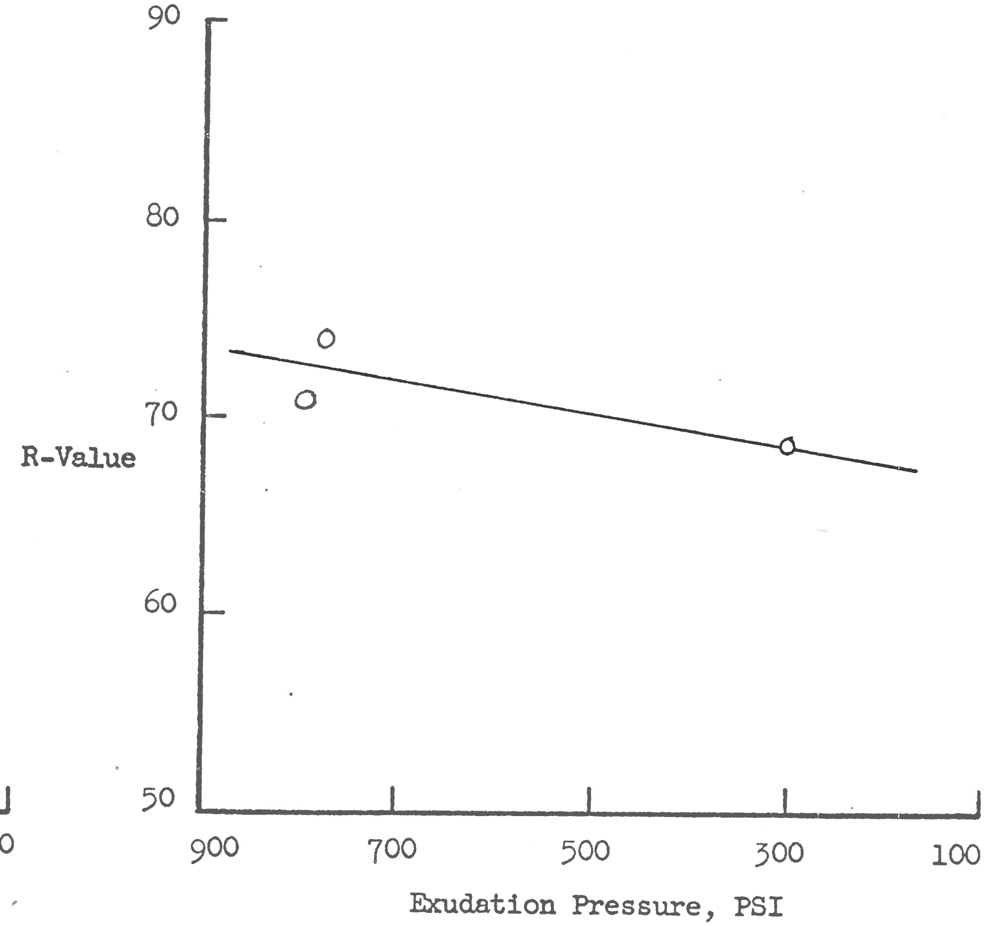
Sample No.: 507
Date Tested: 2-20-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 81
R-Value at 300 PSI: 81



Sample No.: 508
Date Tested: 2-21-68
Visual Description: Sand

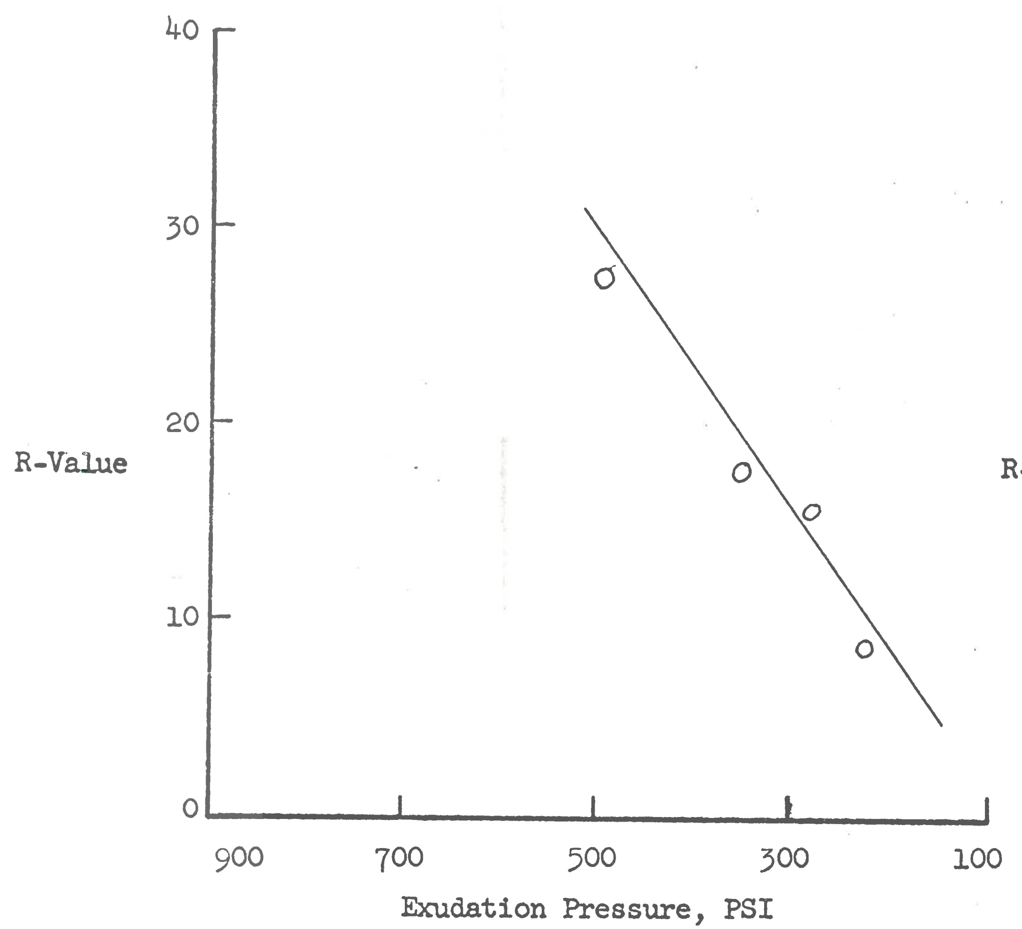
R-Value at 240 PSI: 68
R-Value at 300 PSI: 69



Summary of Data
California R-Value

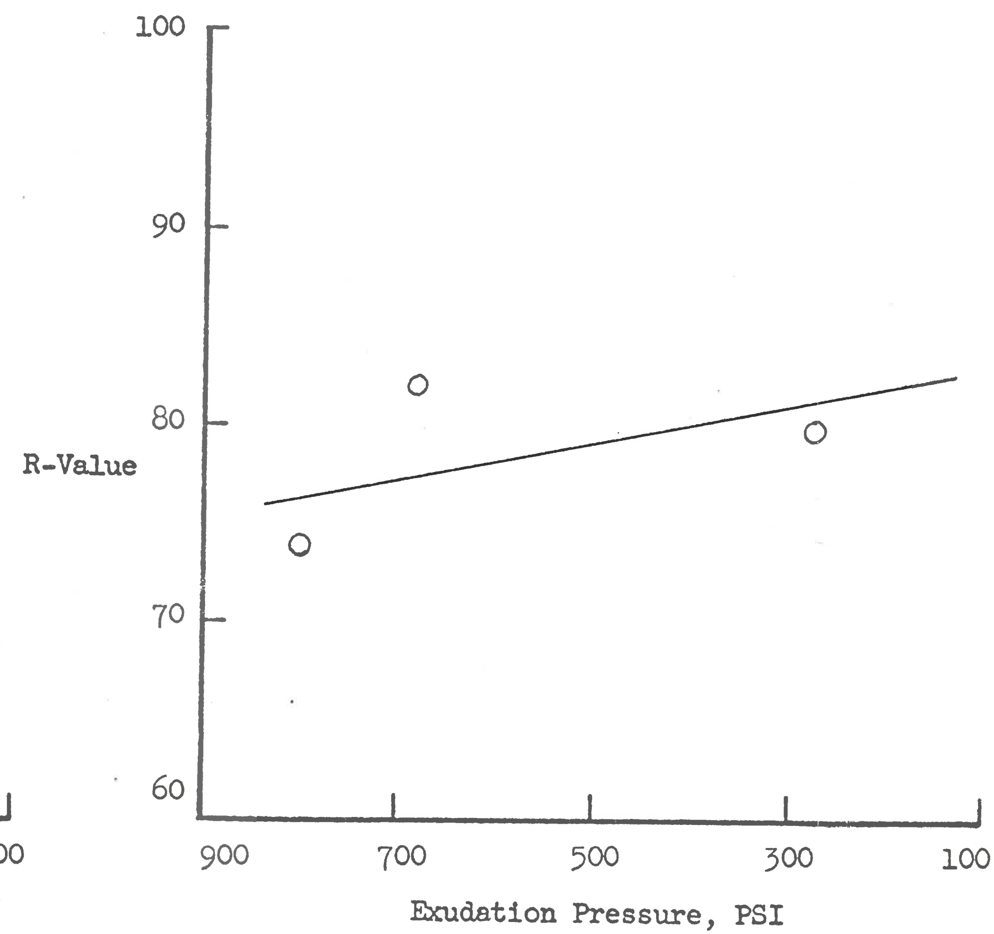
Sample No.: 509
Date Tested: 2-20-68
Visual Description: Black Silty Clay

R-Value at 240 PSI: 12
R-Value at 300 PSI: 16



Sample No.: 510
Date Tested: 2-20-68
Visual Description: Black Silty Sand

R-Value at 240 PSI: 82
R-Value at 300 PSI: 81



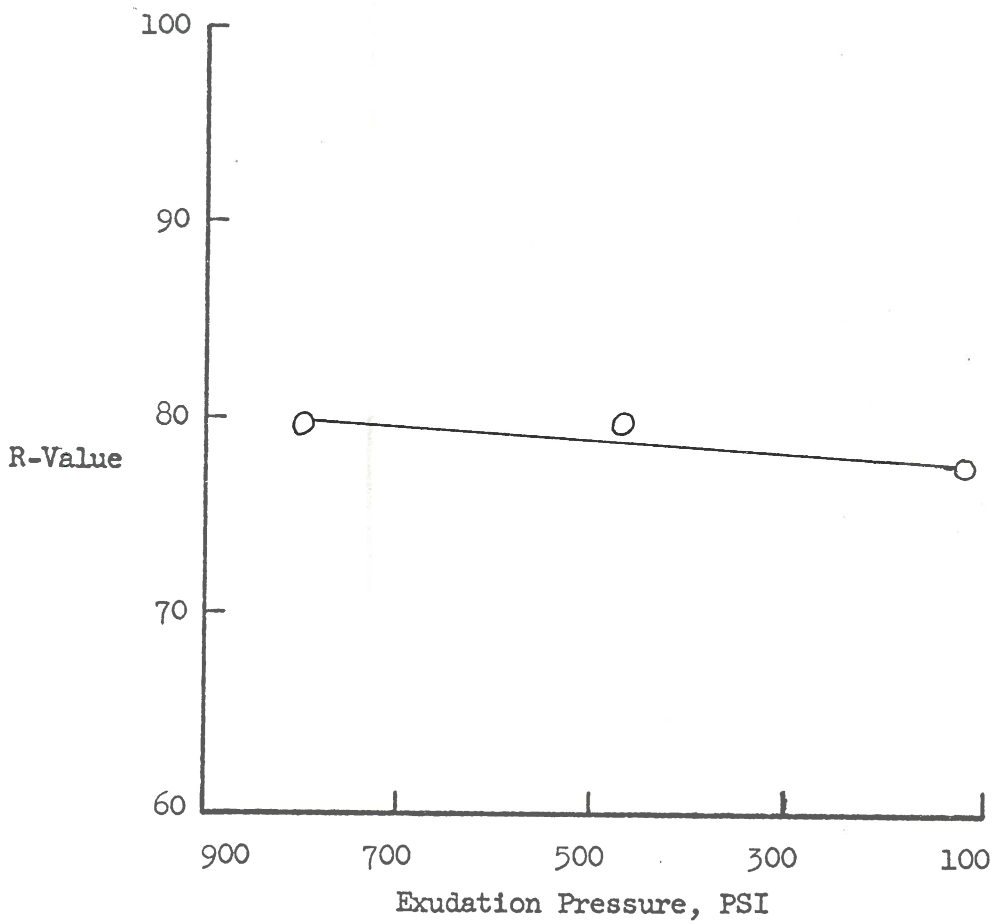
Summary of Data
California R-Value

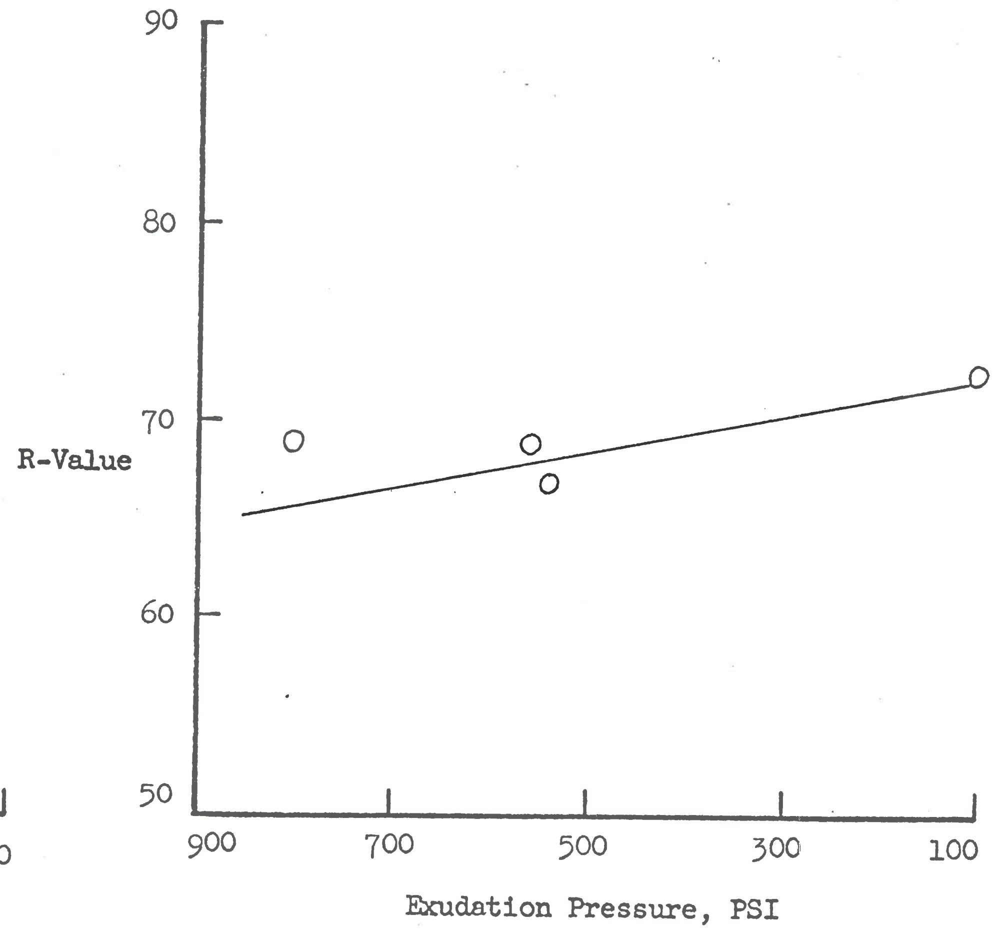
Sample No.: 511
Date Tested: 2-20-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 78
R-Value at 300 PSI: 79

Sample No.: 512
Date Tested: 2-20-68
Visual Description: Clayey Sand

R-Value at 240 PSI: 71
R-Value at 300 PSI: 70





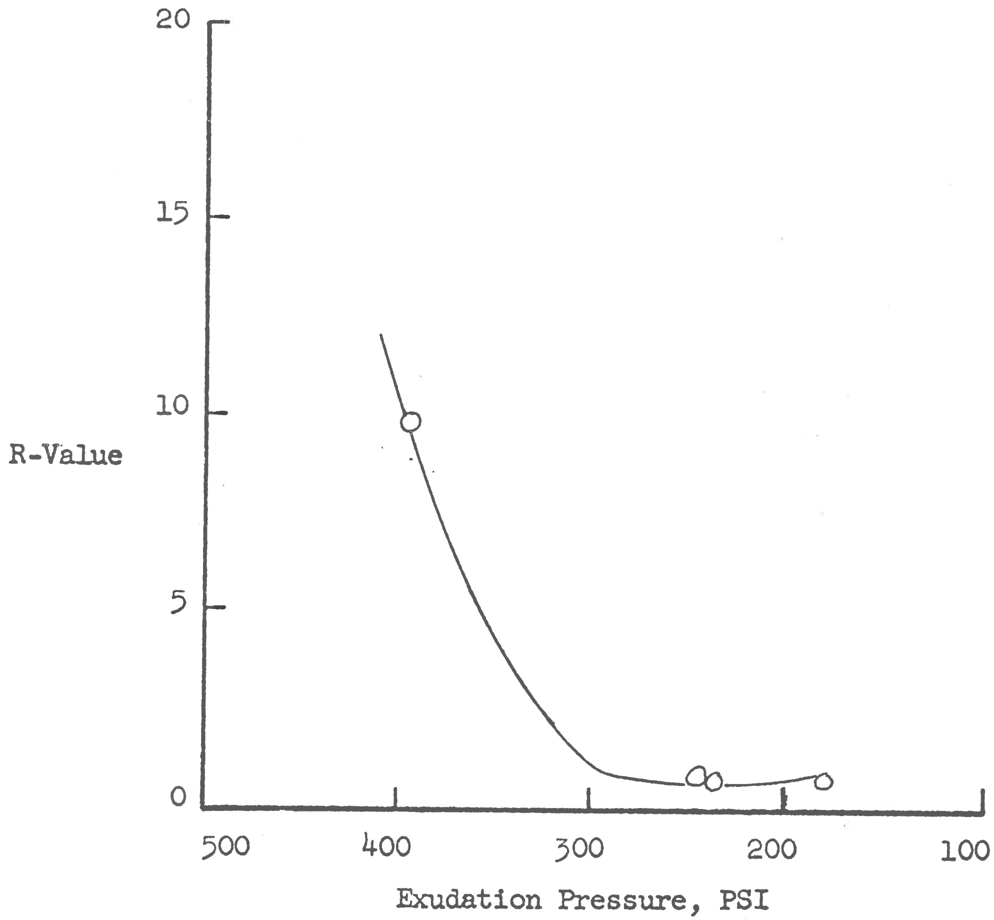
Summary of Data
California R-Value

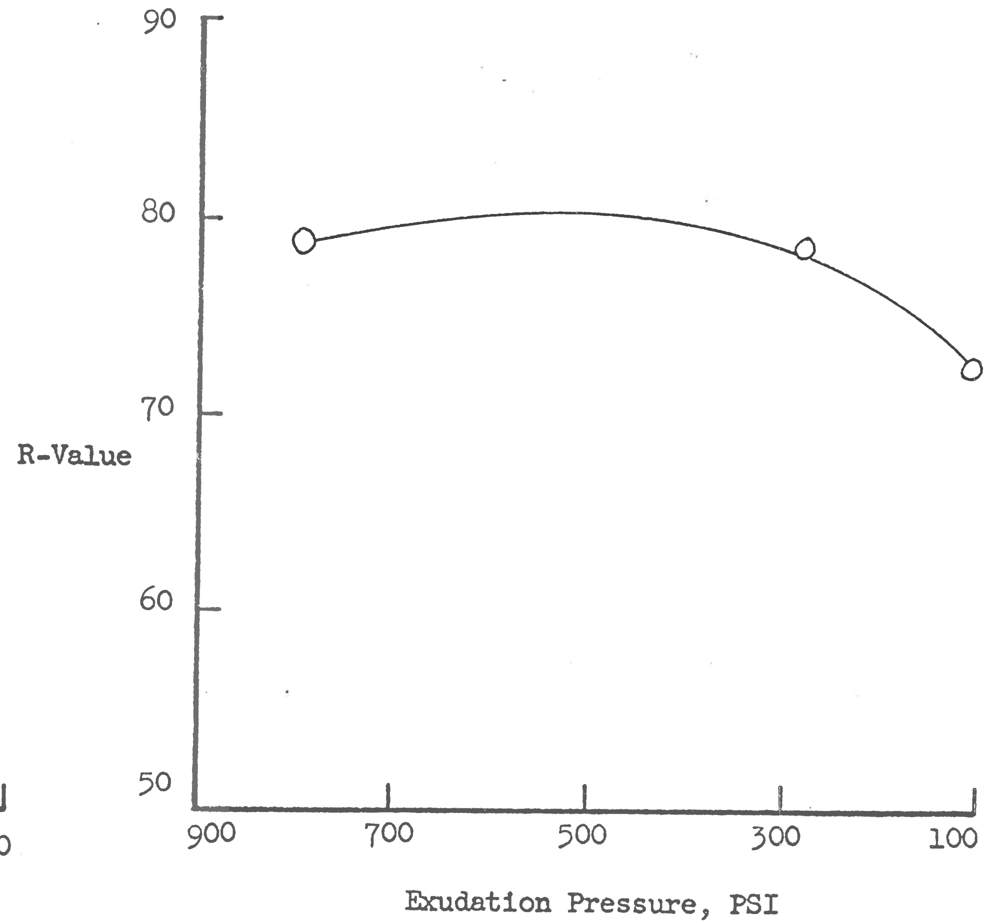
Sample No.: 513
Date Tested: 2-20-68
Visual Description: Black Clay

R-Value at 240 PSI: 01
R-Value at 300 PSI: 01

Sample No.: 514
Date Tested: 2-20-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 77
R-Value at 300 PSI: 79





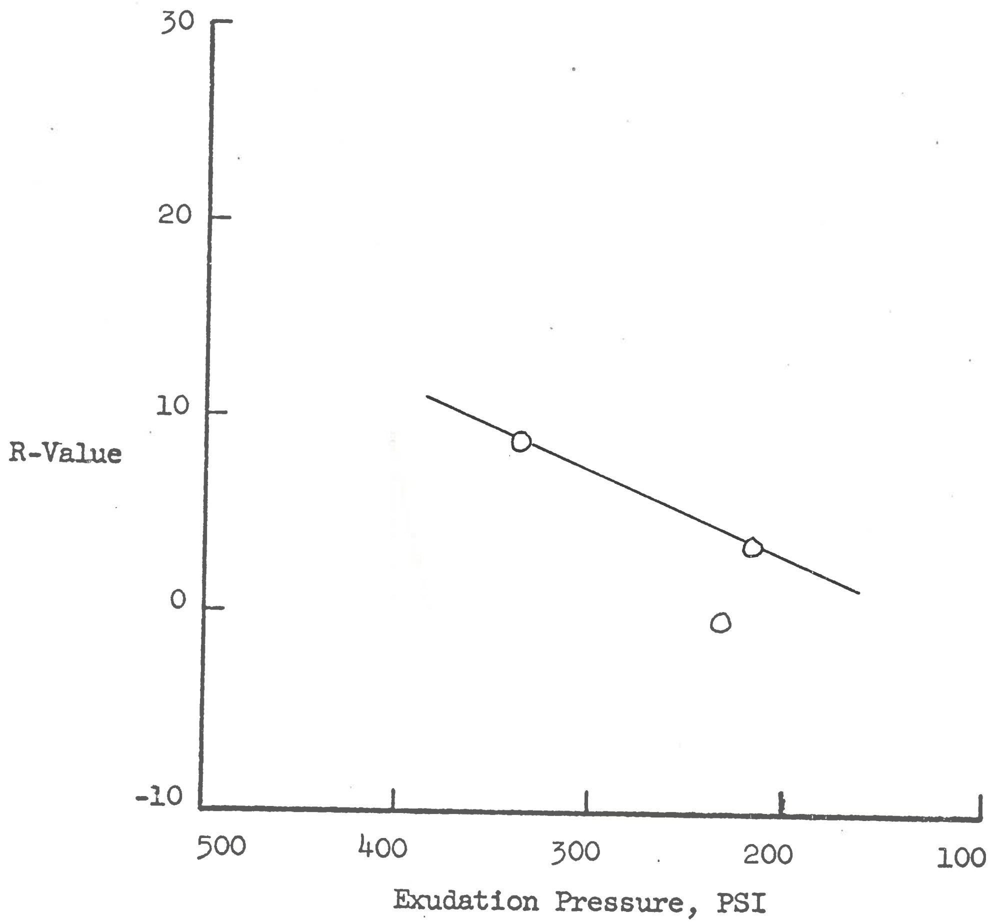
Summary of Data
California R-Value

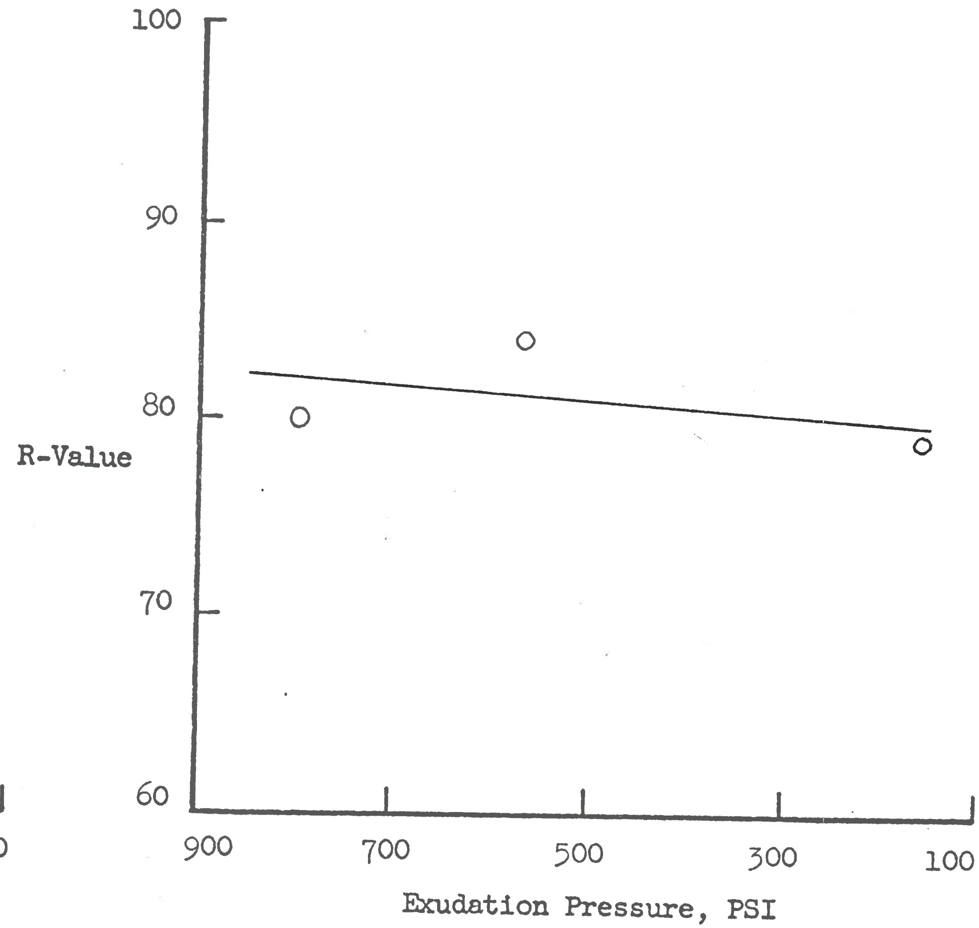
Sample No.: 515
Date Tested: 2-20-68
Visual Description: Tan Clay

R-Value at 240 PSI: 7
R-Value at 300 PSI: 8

Sample No.: 516
Date Tested: 2-26-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 80
R-Value at 300 PSI: 80

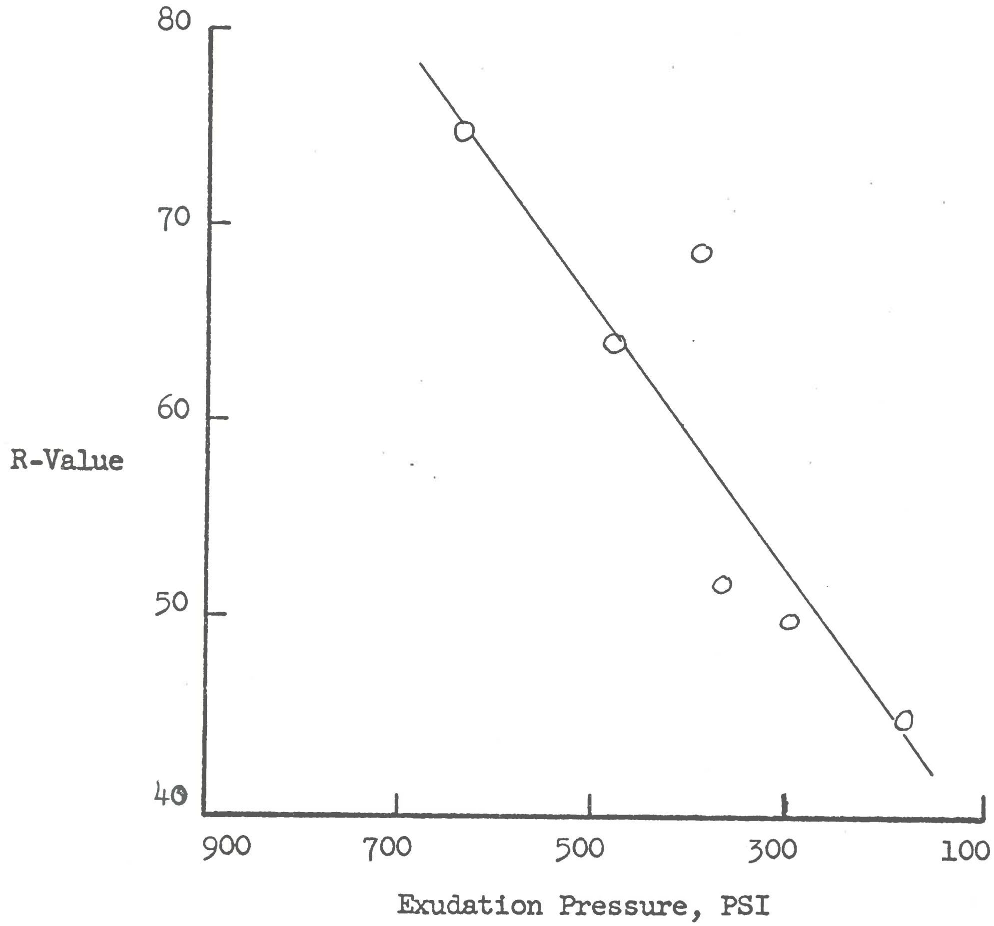




Summary of Data
California R-Value

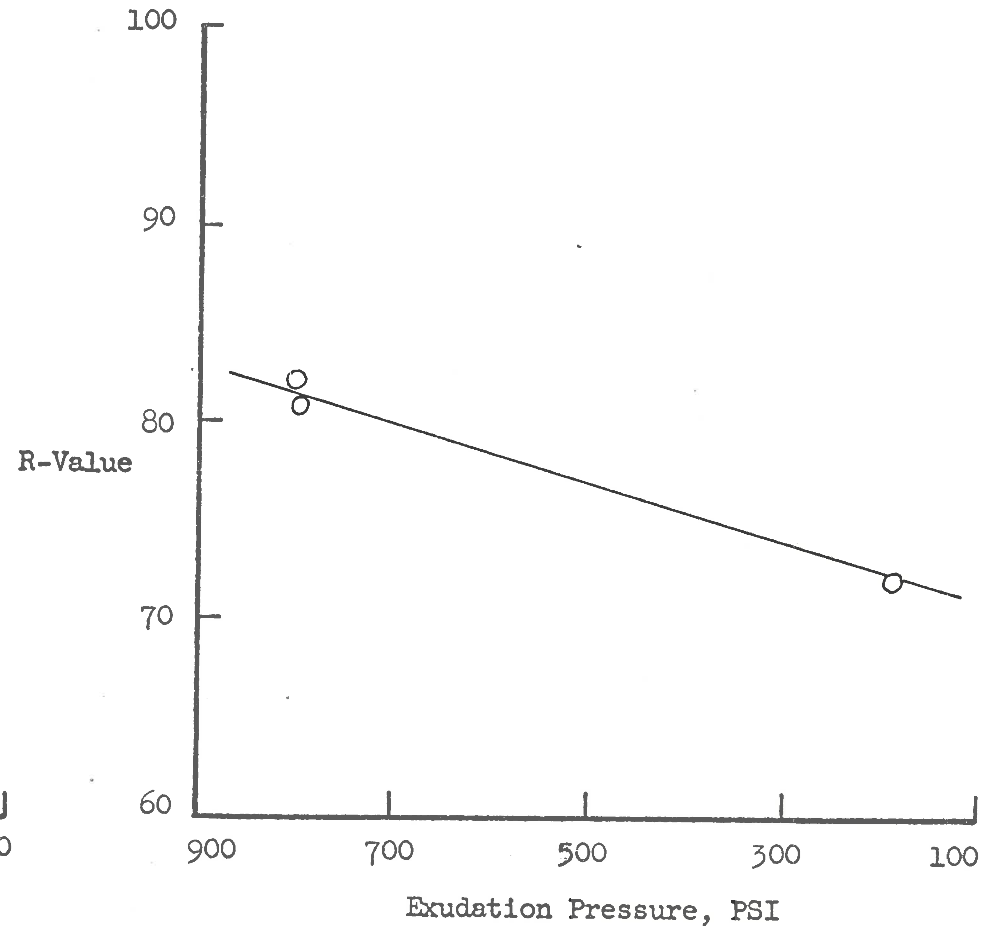
Sample No.: 517
Date Tested: 2-21-68
Visual Description: Sandy Silt

R-Value at 240 PSI: 50
R-Value at 300 PSI: 53



Sample No.: 518
Date Tested: 2-26-68
Visual Description: Gravel and Sand

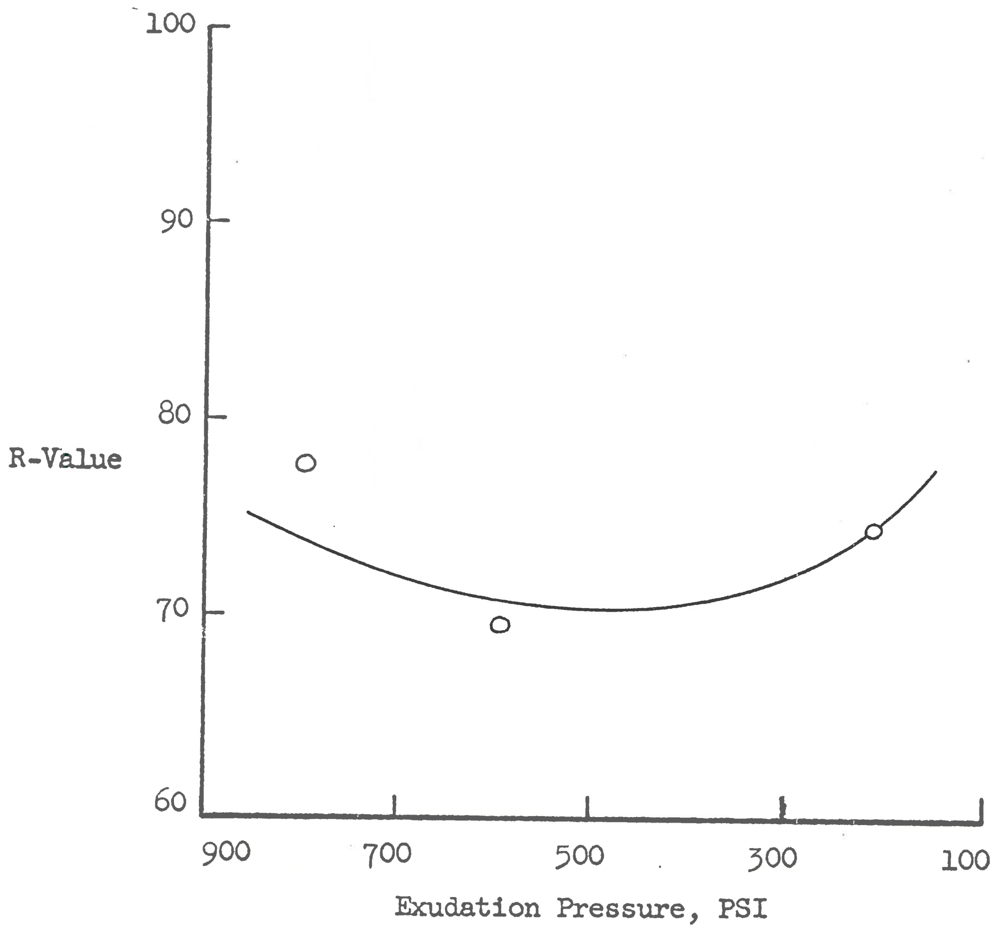
R-Value at 240 PSI: 73
R-Value at 300 PSI: 74

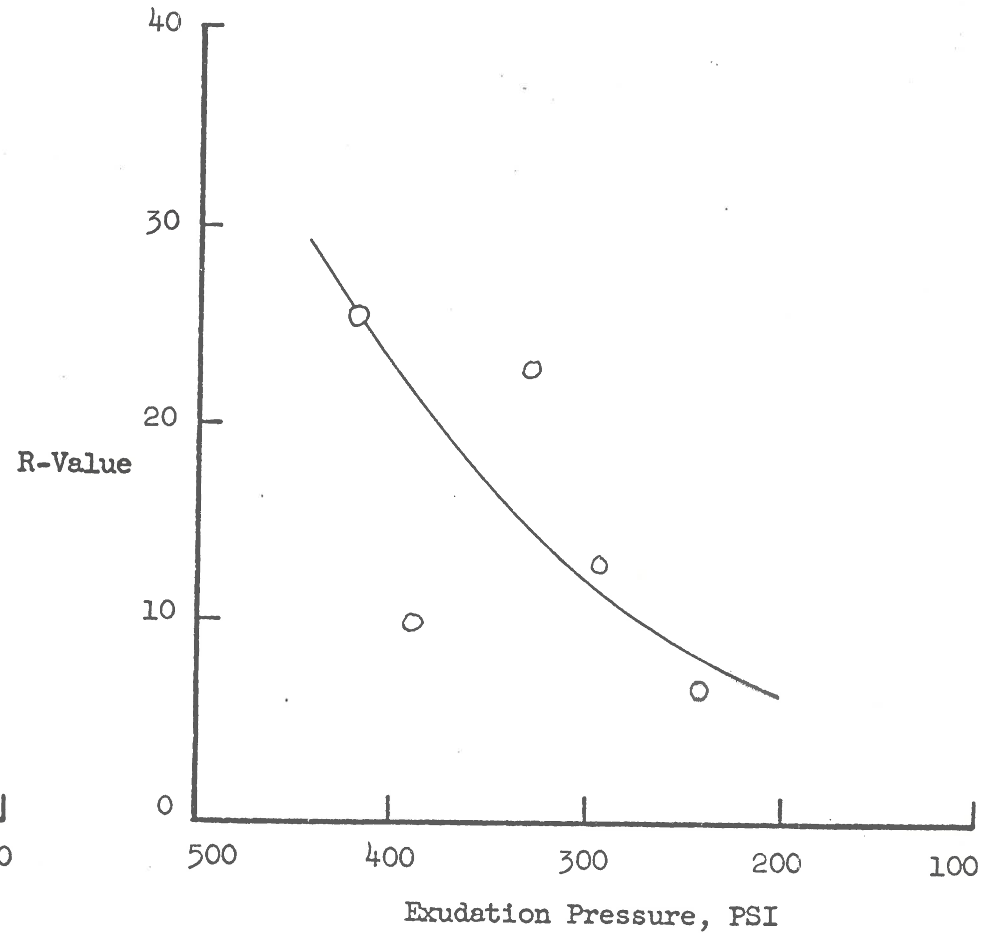


Summary of Data
California R-Value

Sample No.:	519
Date Tested:	2-20-68
Visual Description:	Clayey Sand
R-Value at 240 PSI:	73
R-Value at 300 PSI:	72

Sample No.:	520
Date Tested:	2-21-68
Visual Description:	Yellow Clay
R-Value at 240 PSI:	08
R-Value at 300 PSI:	12



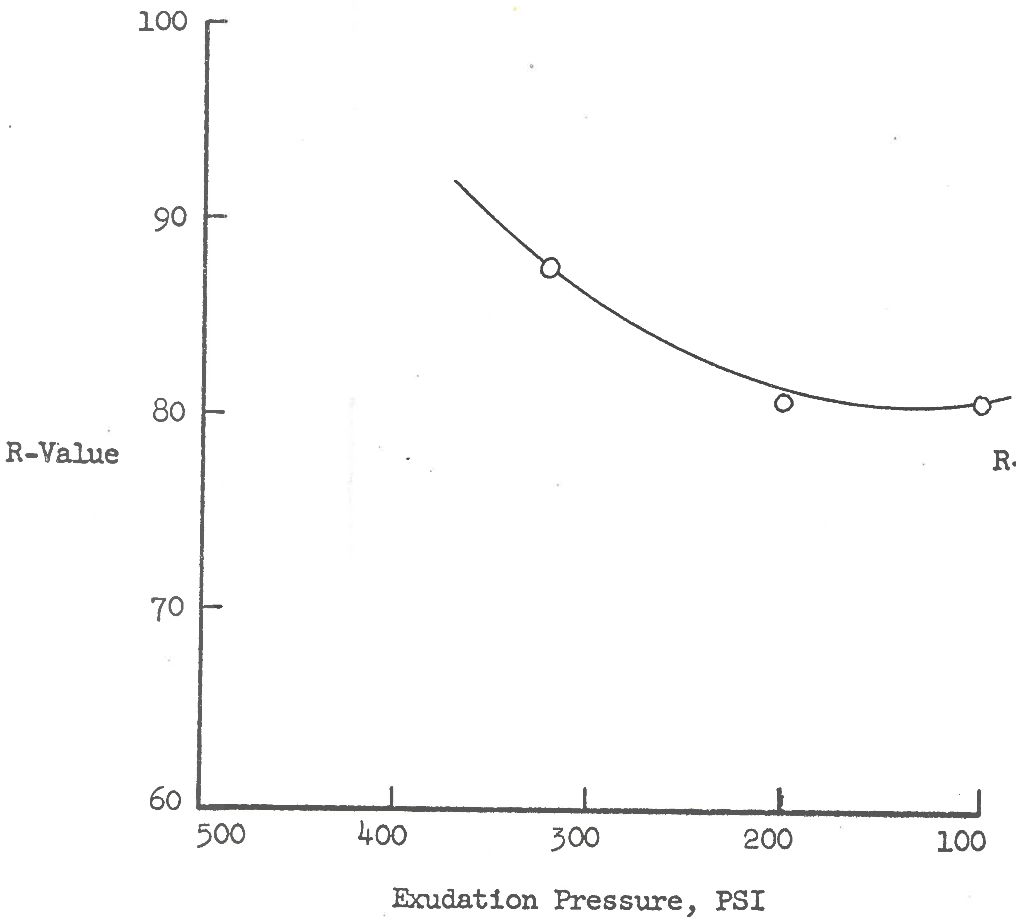


A-167

Summary of Data
California R-Value

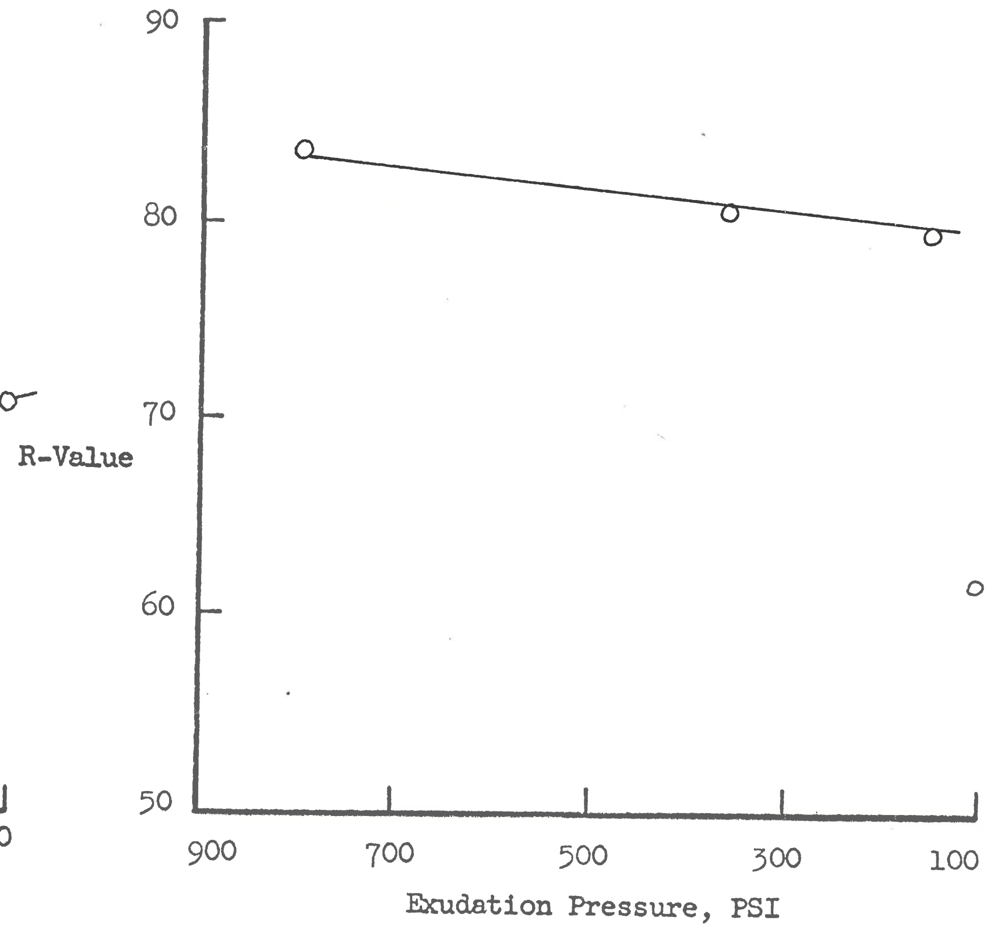
Sample No.: 521
Date Tested: 2-26-68
Visual Description: Black Sandy Silt

R-Value at 240 PSI: 83
R-Value at 300 PSI: 86



Sample No.: 522
Date Tested: 2-20-68
Visual Description: Gravel with Sand

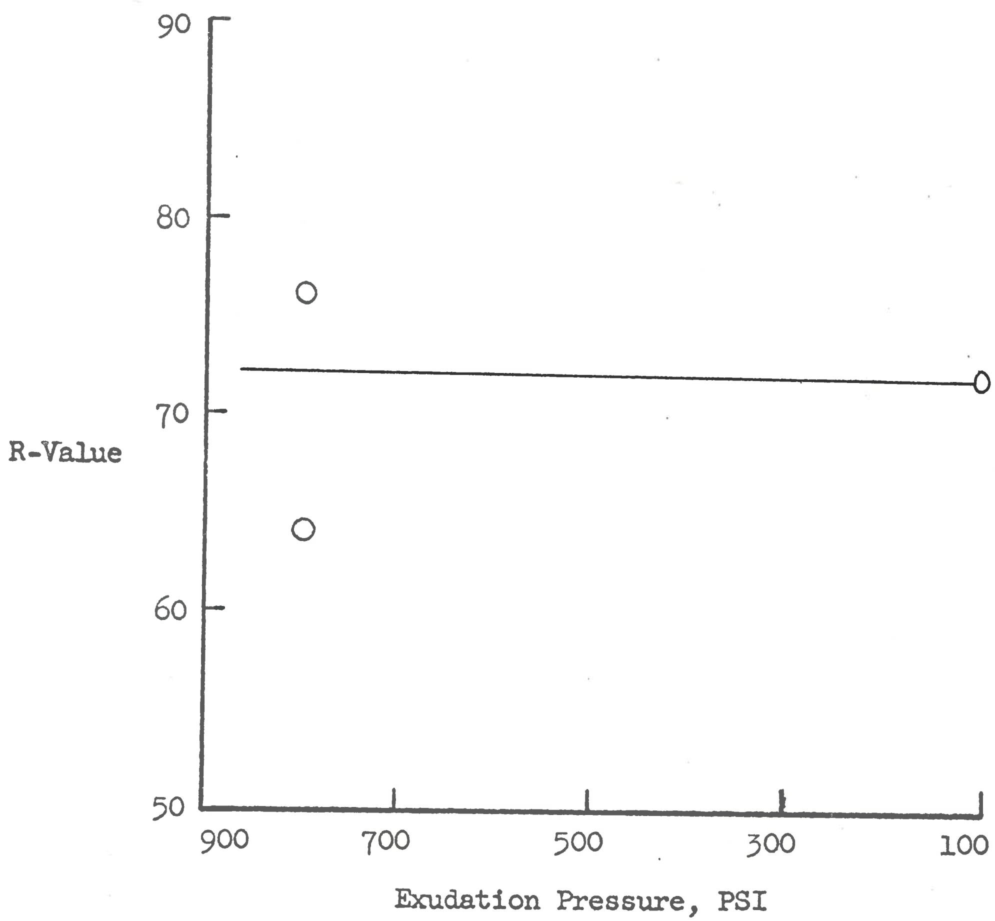
R-Value at 240 PSI: 81
R-Value at 300 PSI: 81



Summary of Data
California R-Value

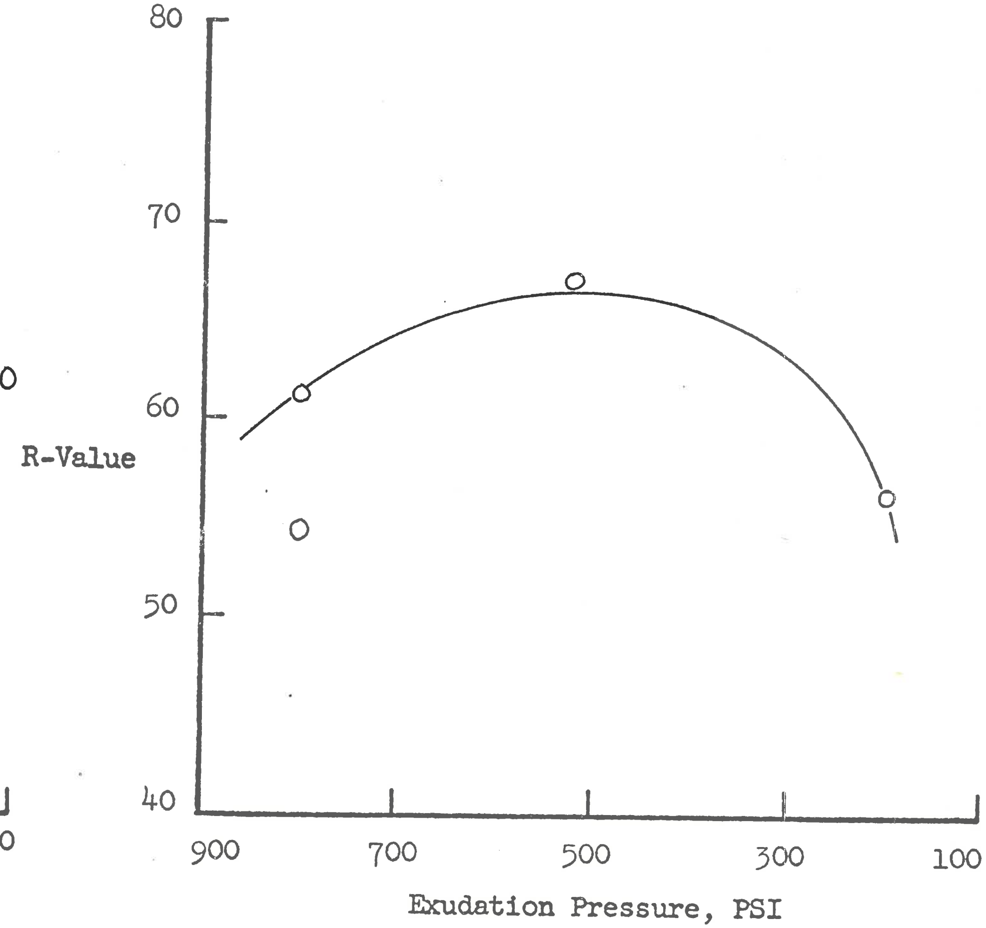
Sample No.: 523
Date Tested: 2-20-68
Visual Description: Sand

R-Value at 240 PSI: 72
R-Value at 300 PSI: 72



Sample No.: 524
Date Tested: 2-20-68
Visual Description: Gravel with Fine Sand

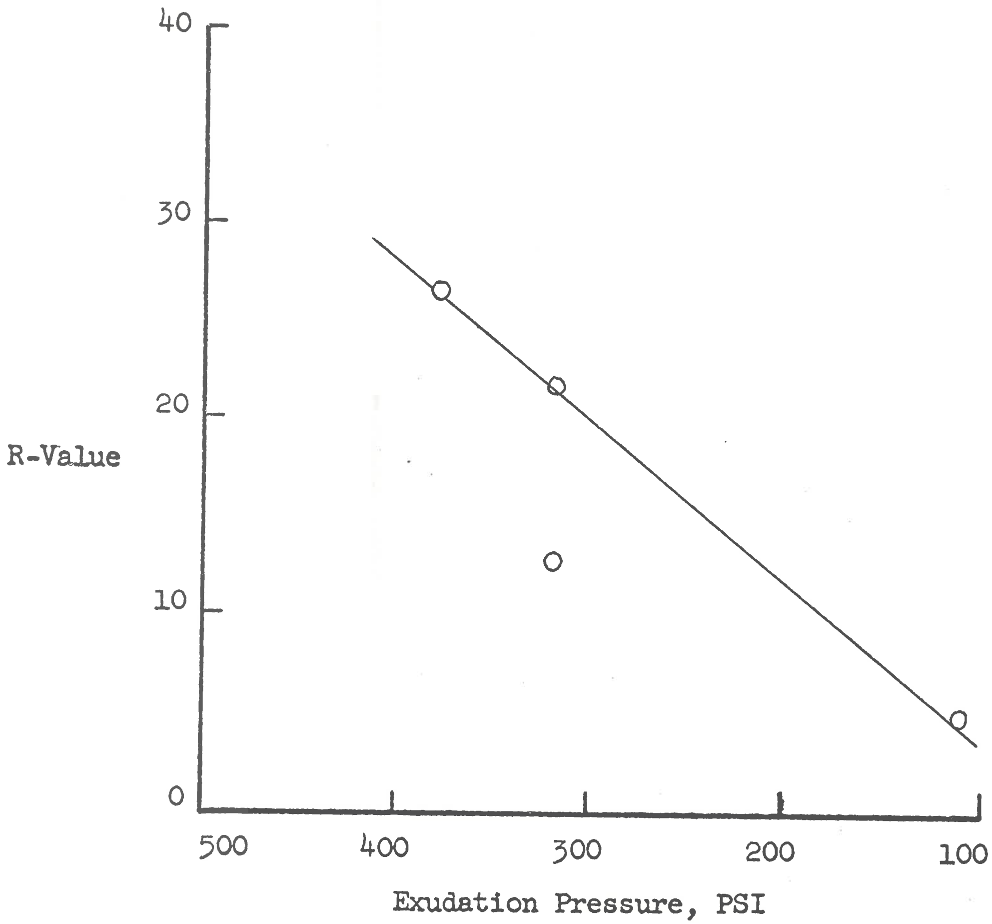
R-Value at 240 PSI: 61
R-Value at 300 PSI: 64



Summary of Data
California R-Value

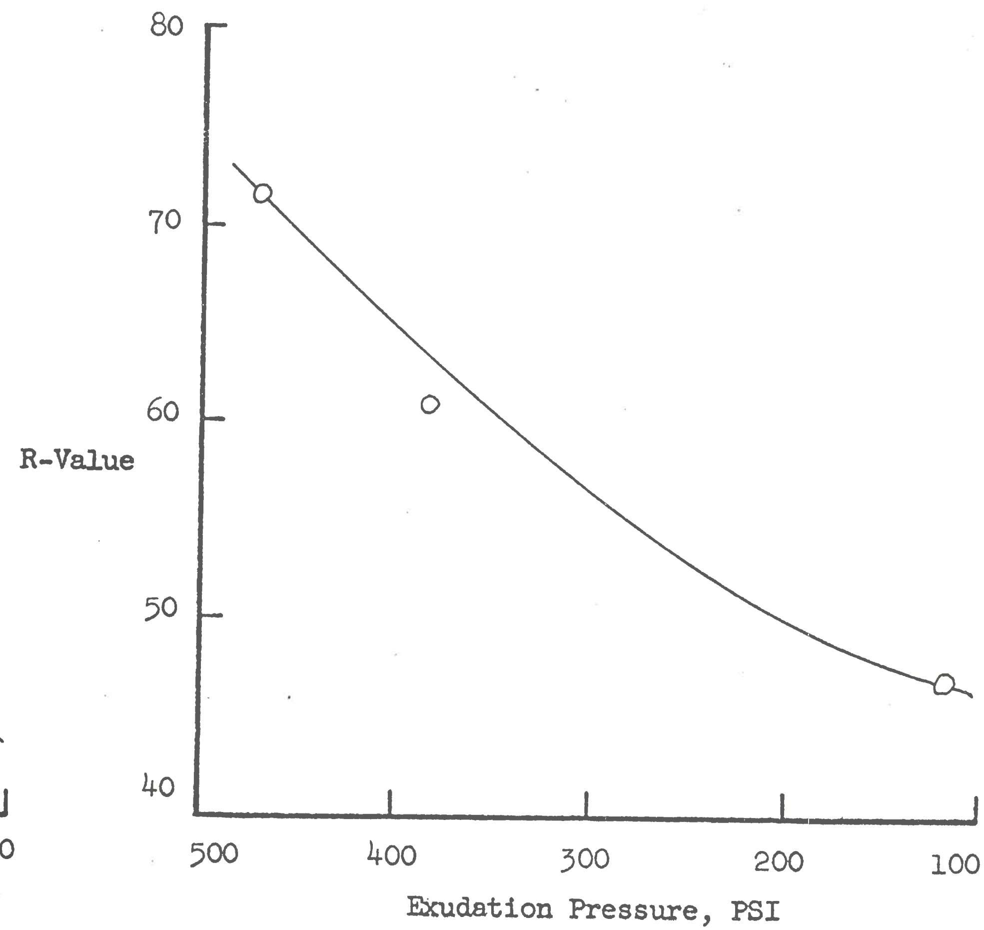
Sample No.: 525
Date Tested: 2-20-68
Visual Description: Tan Clay

R-Value at 240 PSI: 15
R-Value at 300 PSI: 20



Sample No.: 526
Date Tested: 2-20-68
Visual Description: Gravel and Red Silt

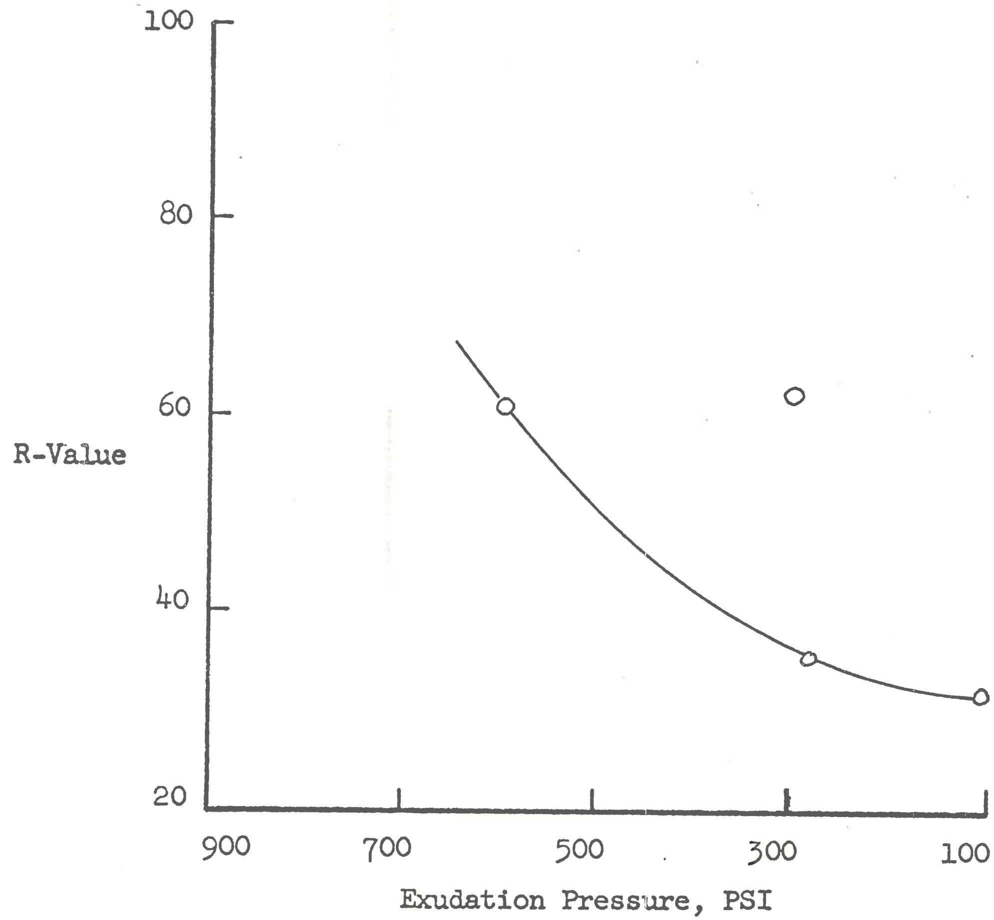
R-Value at 240 PSI: 52
R-Value at 300 PSI: 56



Summary of Data
California R-Value

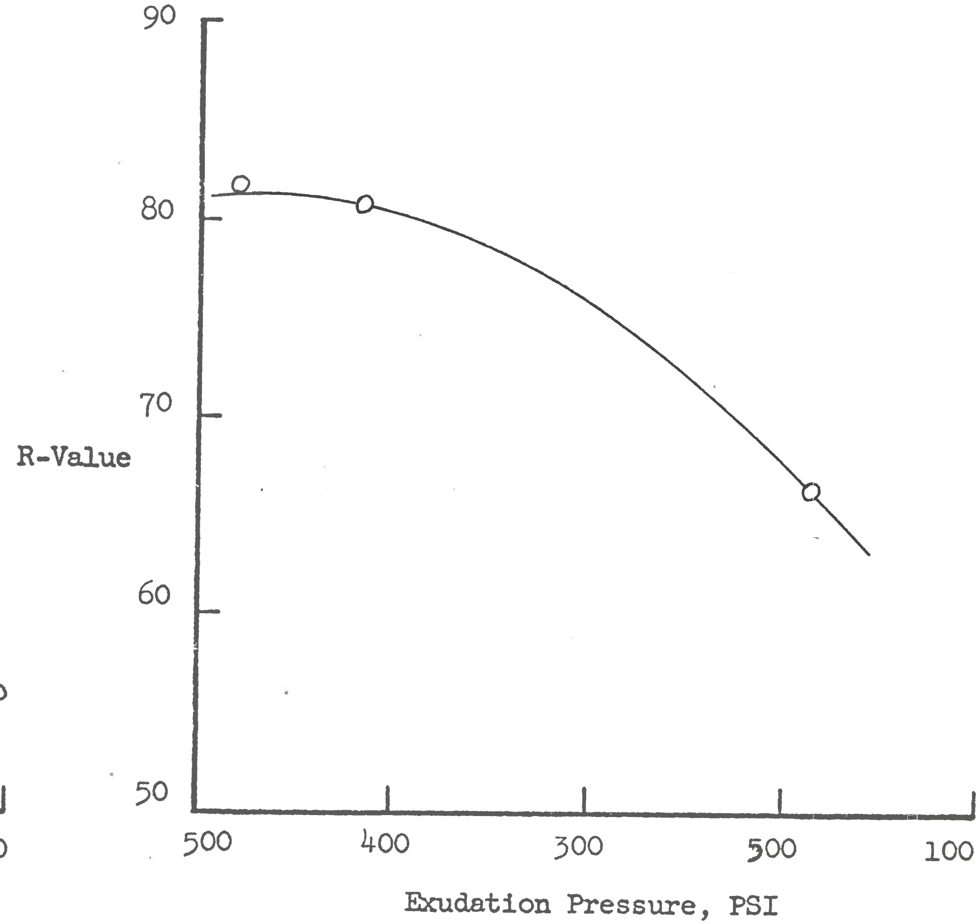
Sample No.: 527
Date Tested: 2-20-68
Visual Description: Red Clayey Sand

R-Value at 240 PSI: 34
R-Value at 300 PSI: 37



Sample No.: 528
Date Tested: 2-26-68
Visual Description: Gravel with Fine Sand

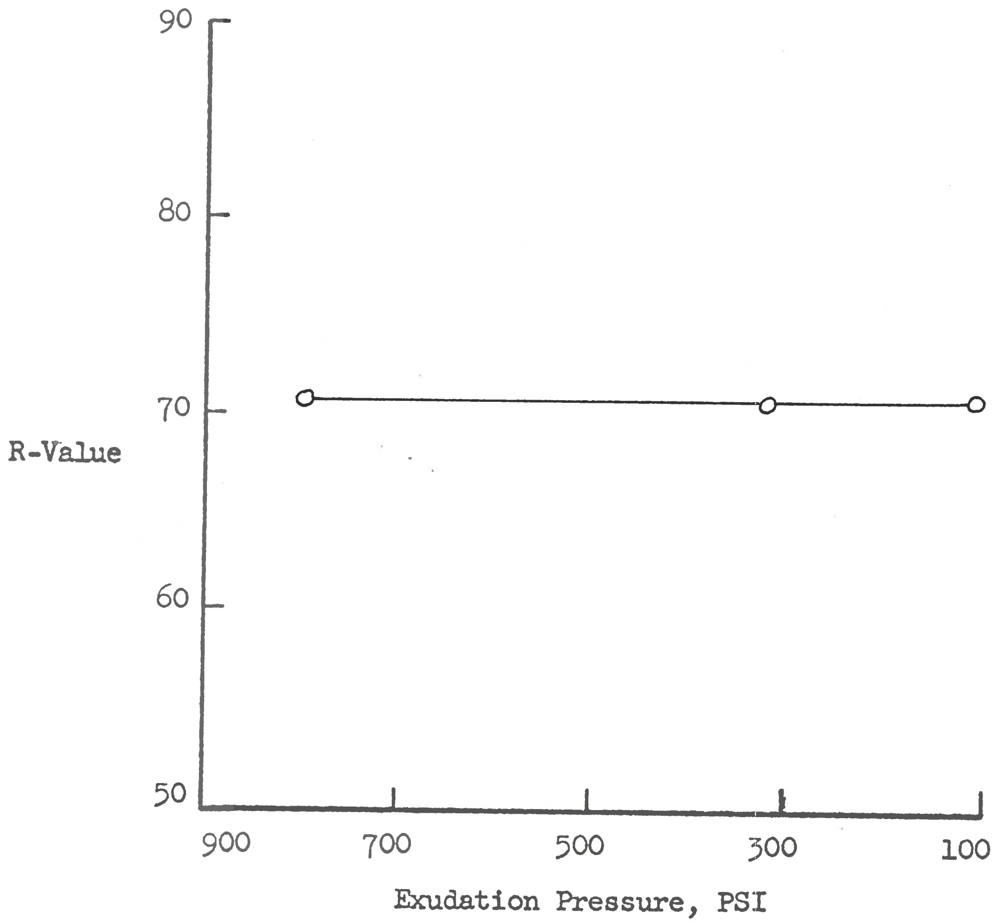
R-Value at 240 PSI: 72
R-Value at 300 PSI: 76



Summary of Data
California R-Value

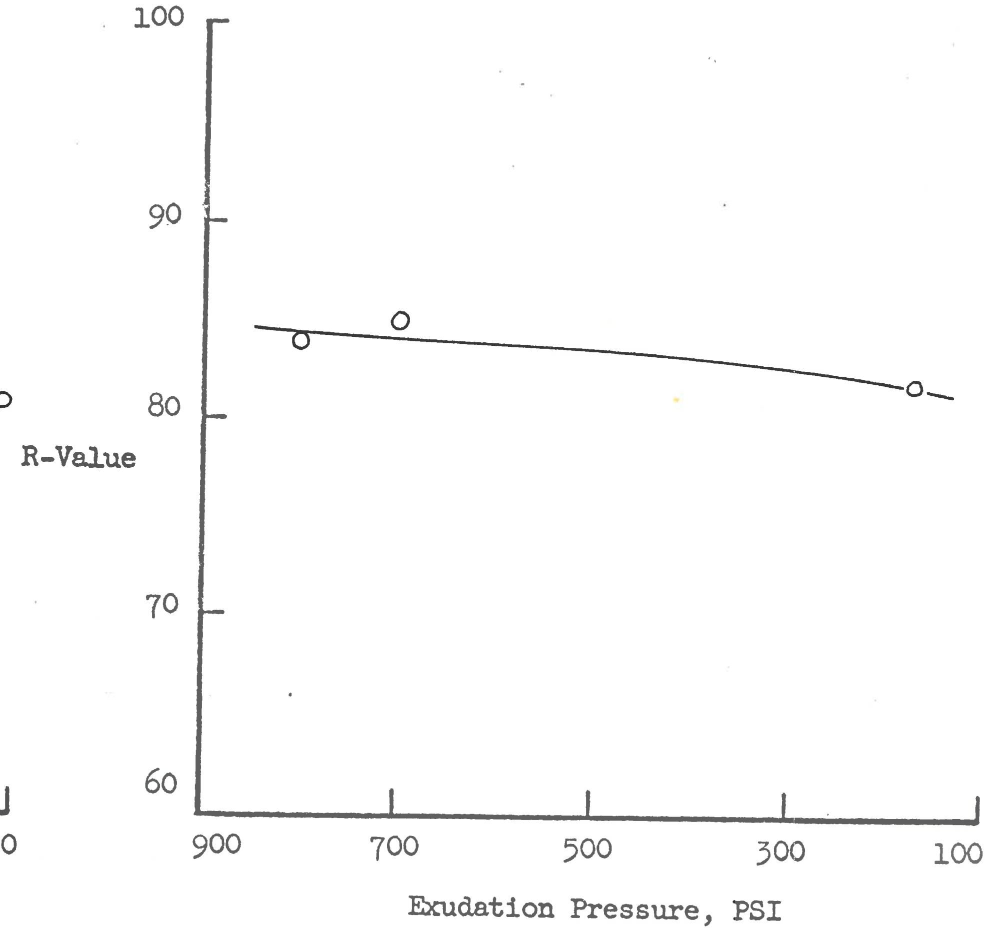
Sample No.: 529
Date Tested: 2-20-68
Visual Description: Fine Sand

R-Value at 240 PSI: 71
R-Value at 300 PSI: 71



Sample No.: 530
Date Tested: 2-26-68
Visual Description: Gravel with Fine Sand

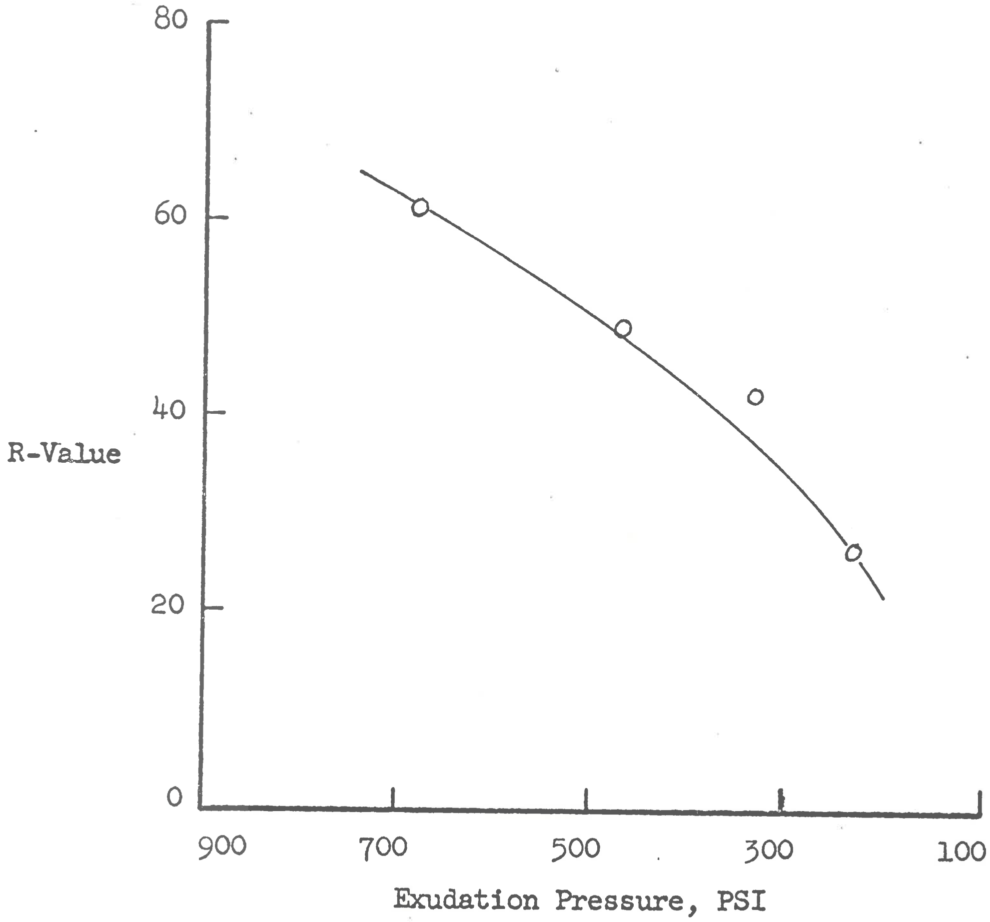
R-Value at 240 PSI: 82
R-Value at 300 PSI: 83



Summary of Data
California R-Value

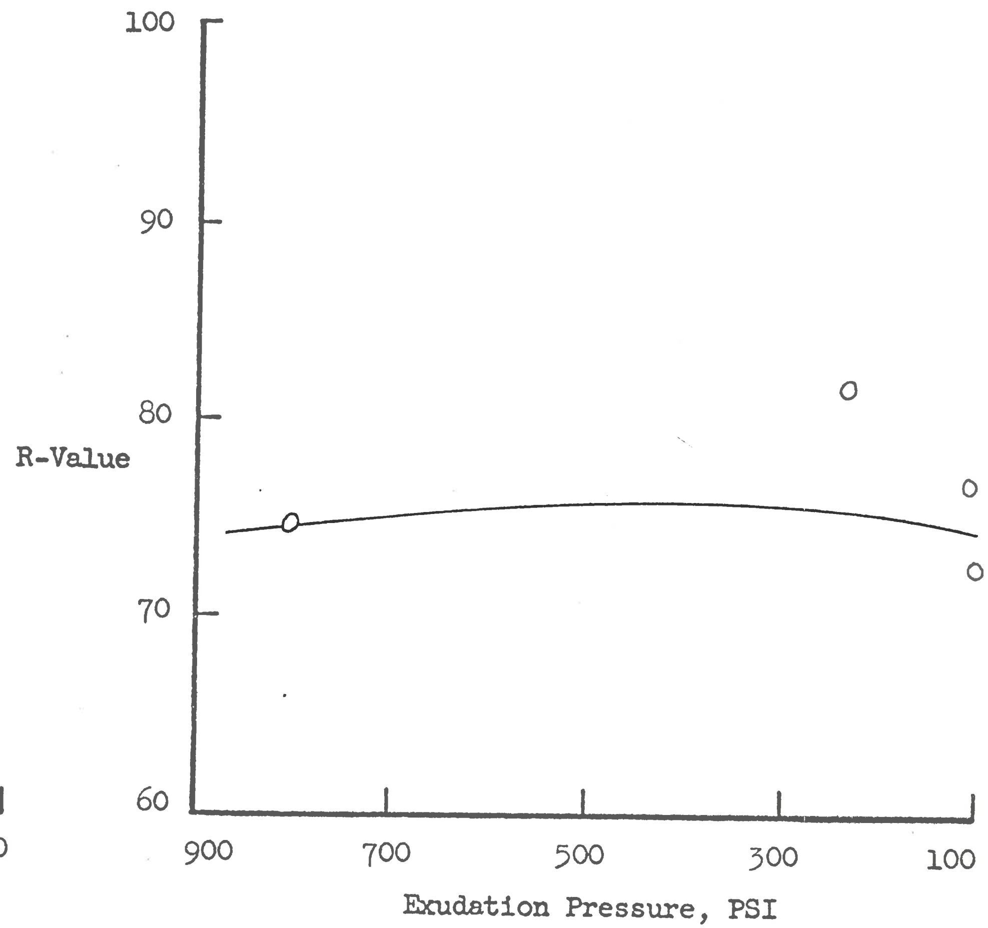
Sample No.: 531
Date Tested: 2-20-68
Visual Description: Black Clay with Gravel

R-Value at 240 PSI: 30
R-Value at 300 PSI: 35



Sample No.: 532
Date Tested: 2-20-68
Visual Description: Fine Sand

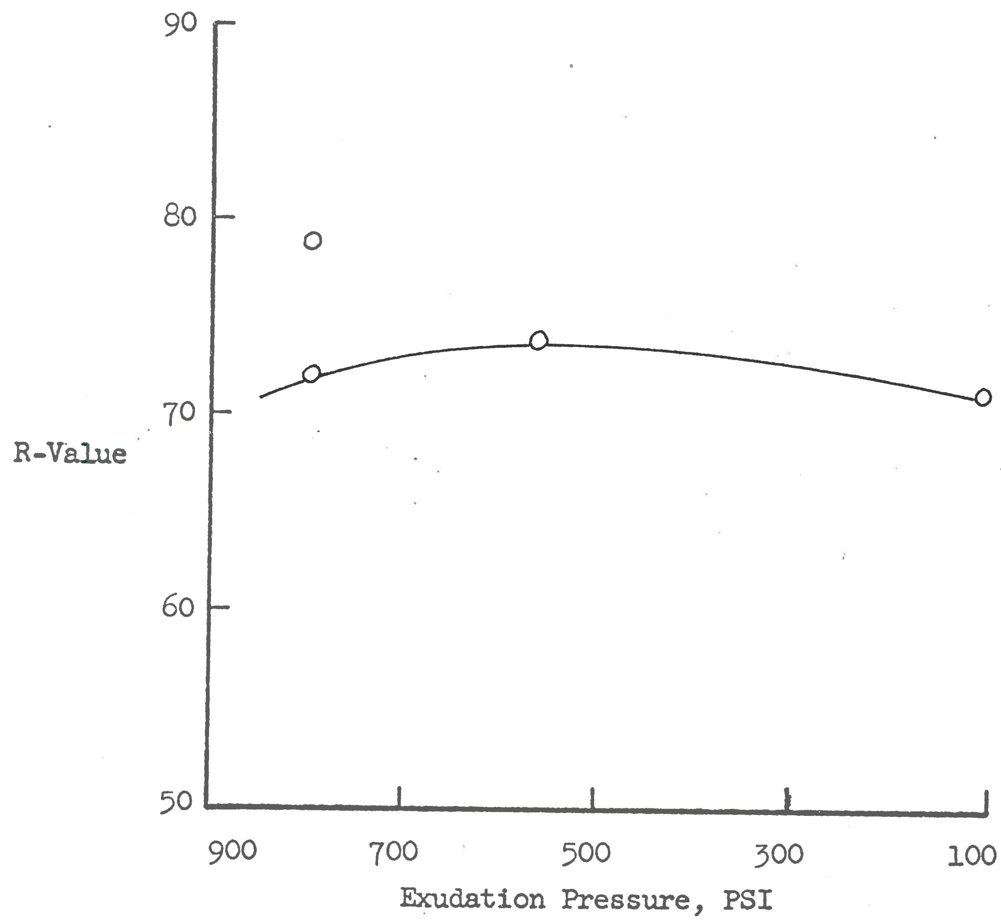
R-Value at 240 PSI: 75
R-Value at 300 PSI: 76



Summary of Data
California R-Value

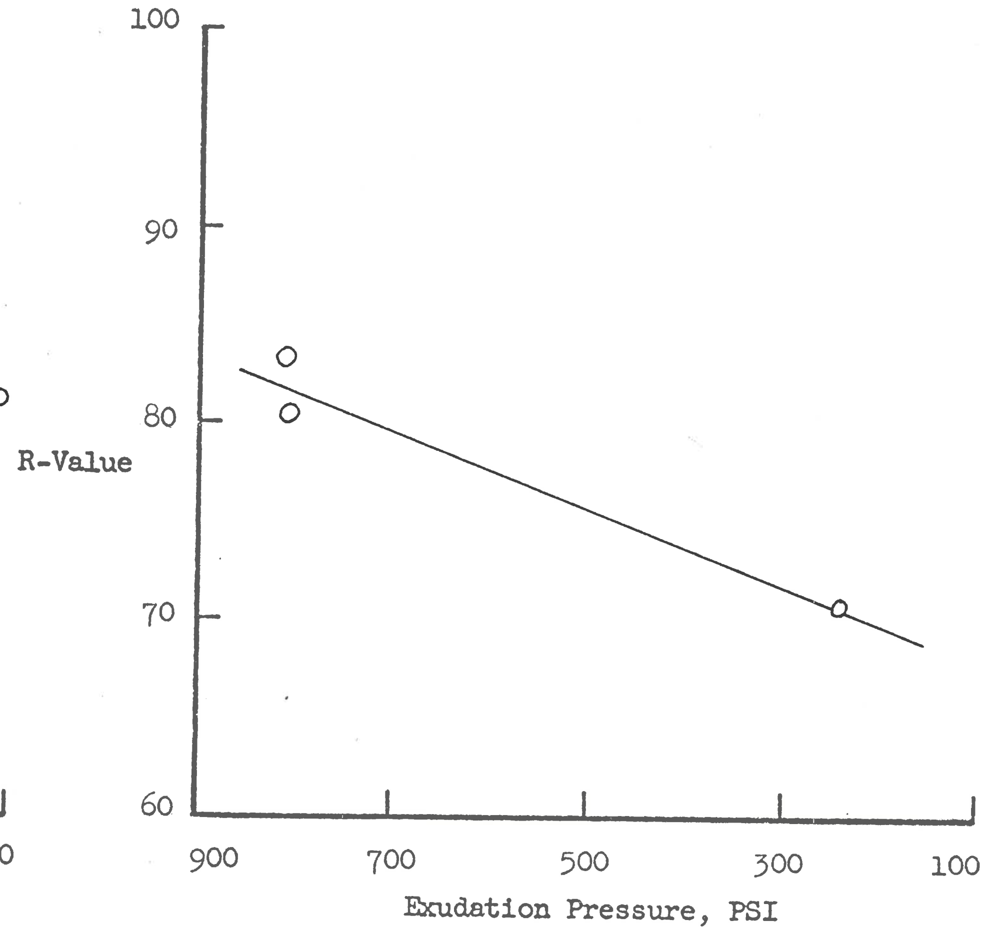
Sample No.: 533
Date Teste.: 2-20-68
Visual Description: Fine Sand

R-Value at 240 PSI: 72
R-Value at 300 PSI: 72



Sample No.: 534
Date Tested: 2-20-68
Visual Description: Fine Red Sand

R-Value at 240 PSI: 71
R-Value at 300 PSI: 72



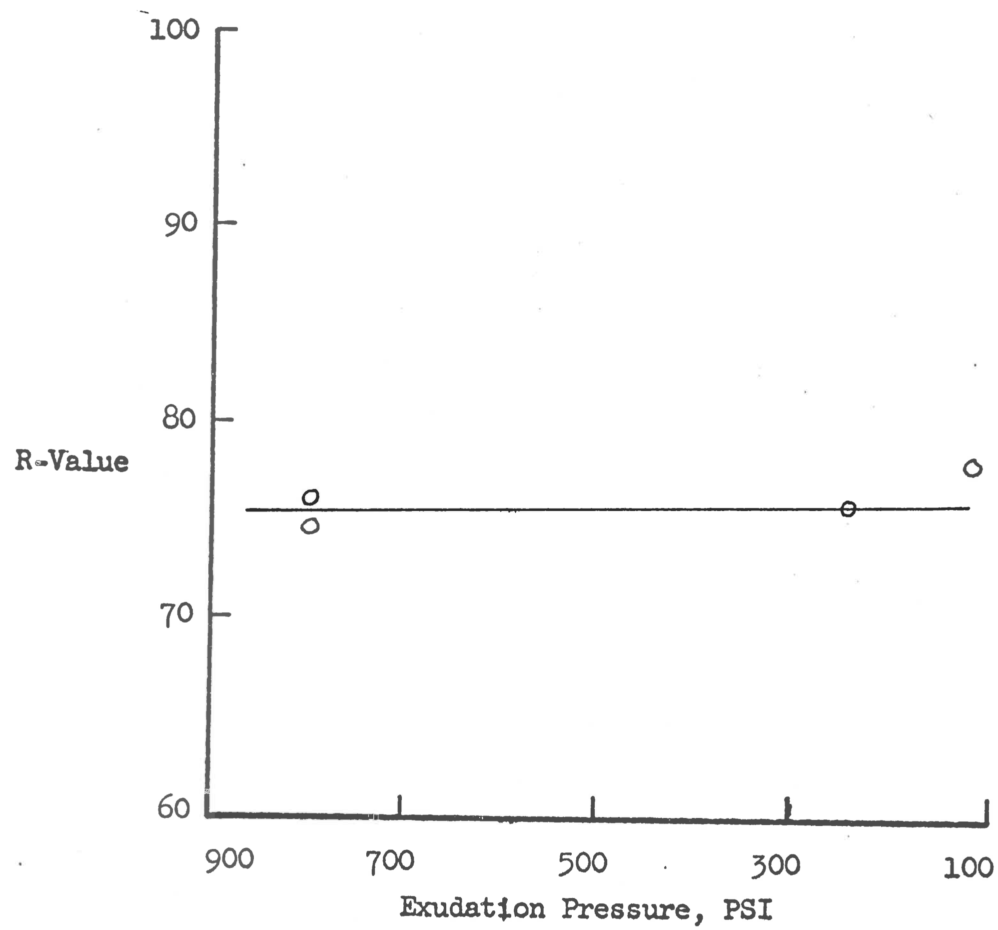
Summary of Data
California R-Value

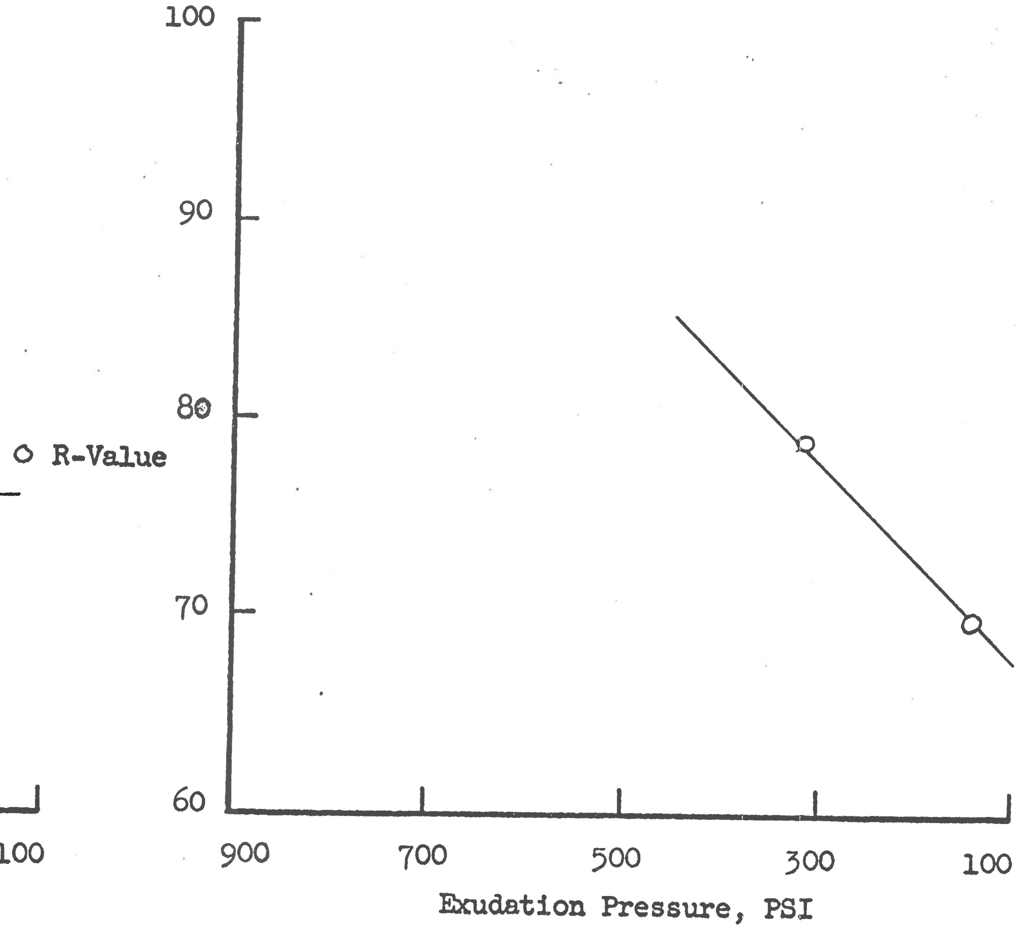
Sample No.: 535
Date Tested: 2-20-68
Visual Description: Clayey Sand

R-Value at 240 PSI: 76
R-Value at 300 PSI: 76

Sample No.: 536
Date Tested: 2-20-68
Visual Description: Sand

R-Value at 240 PSI: 77
R-Value at 300 PSI: 79

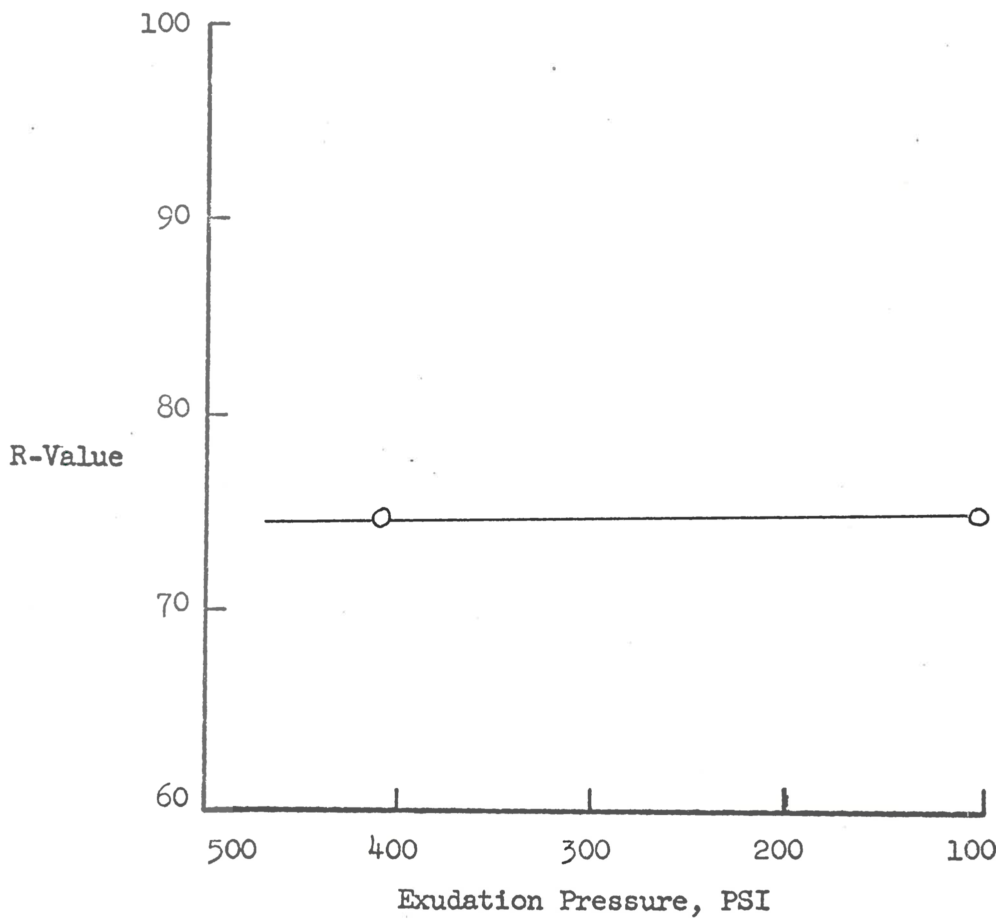




Summary of Data
California R-Value

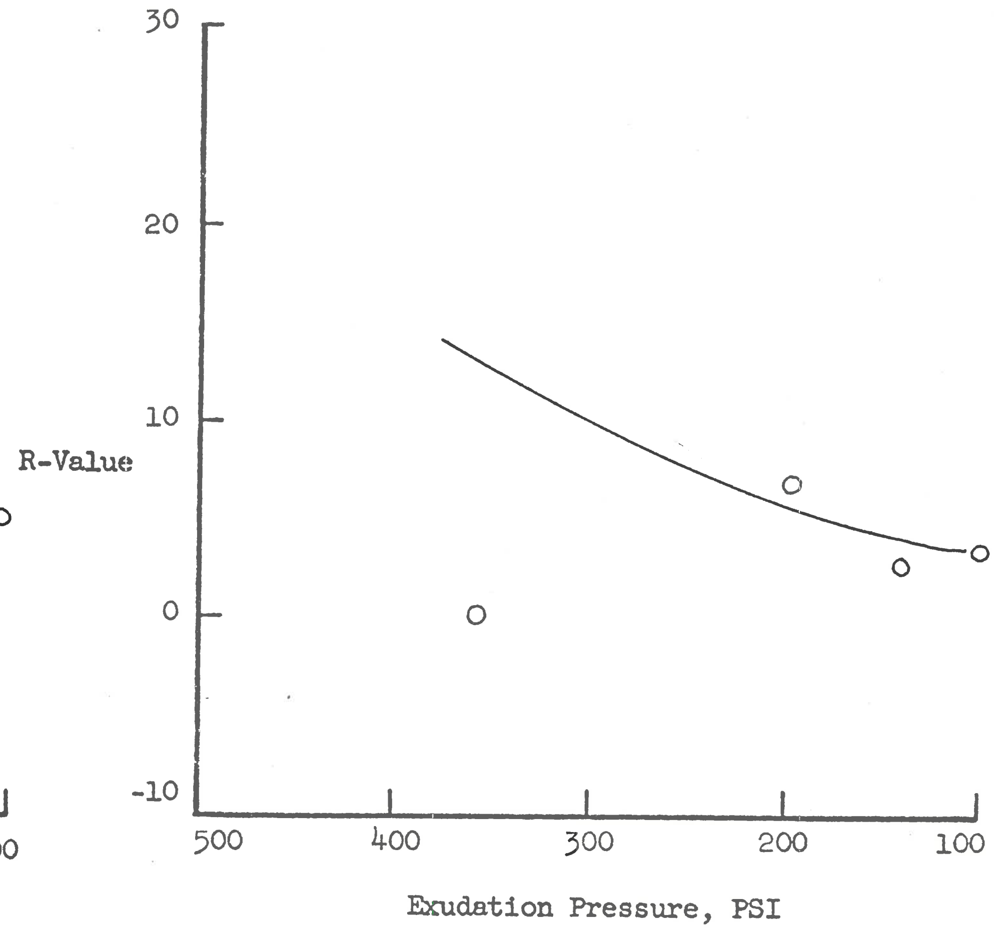
Sample No.: 537
Date Tested: 2-20-68
Visual Description: Silty Sand

R-Value at 240 PSI: 75
R-Value at 300 PSI: 75



Sample No.: 538
Date Tested: 2-20-68
Visual Description: Tan Clay with Gravel

R-Value at 240 PSI: 08
R-Value at 300 PSI: 10



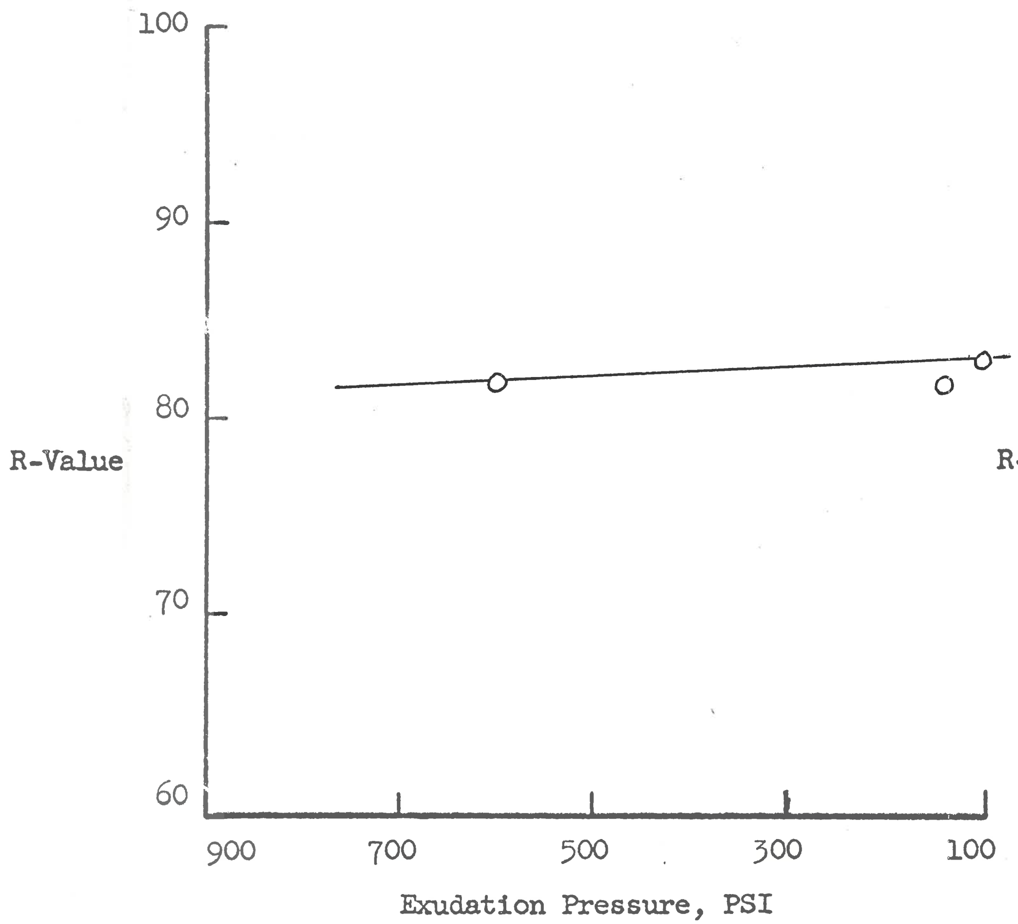
Summary of Data
California R-Value

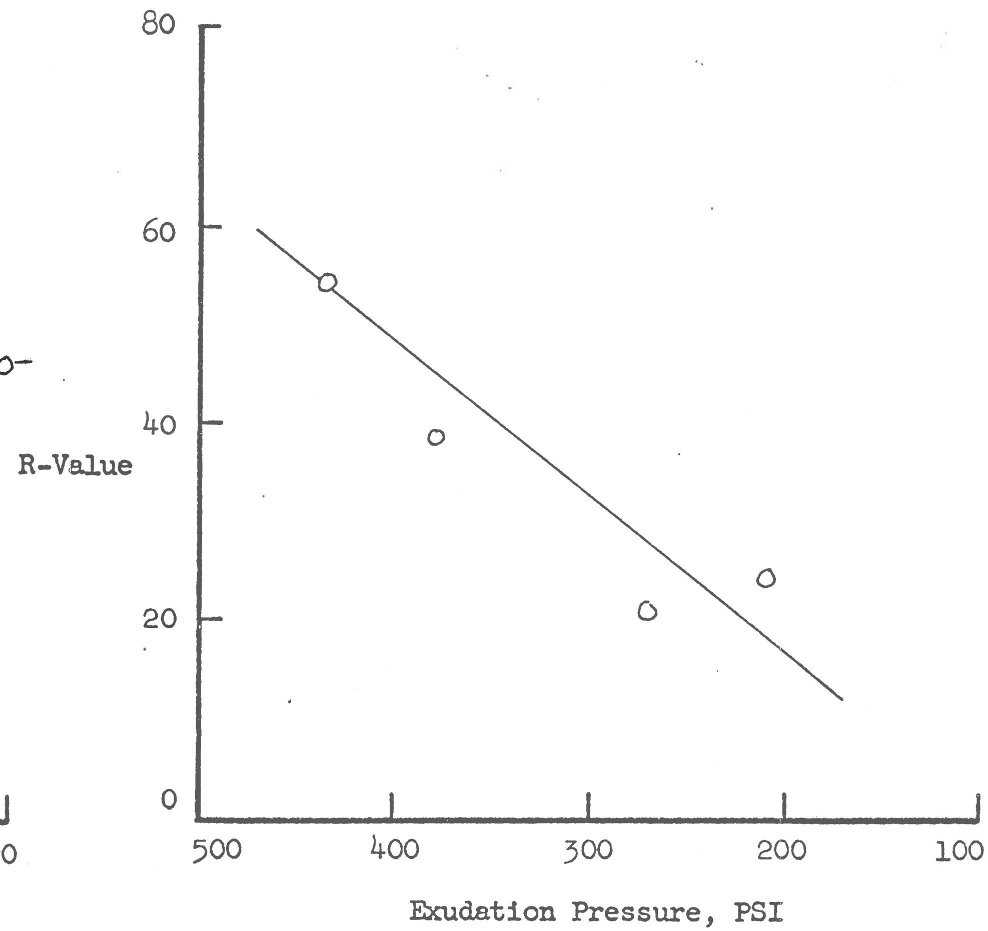
Sample No.: 539
Date Tested: 2-20-68
Visual Description: Gravel with Silty Sand

R-Value at 240 PSI: 83
R-Value at 300 PSI: 83

Sample No.: 540
Date Tested: 2-20-68
Visual Description: Yellow Silt

R-Value at 240 PSI: 21
R-Value at 300 PSI: 27





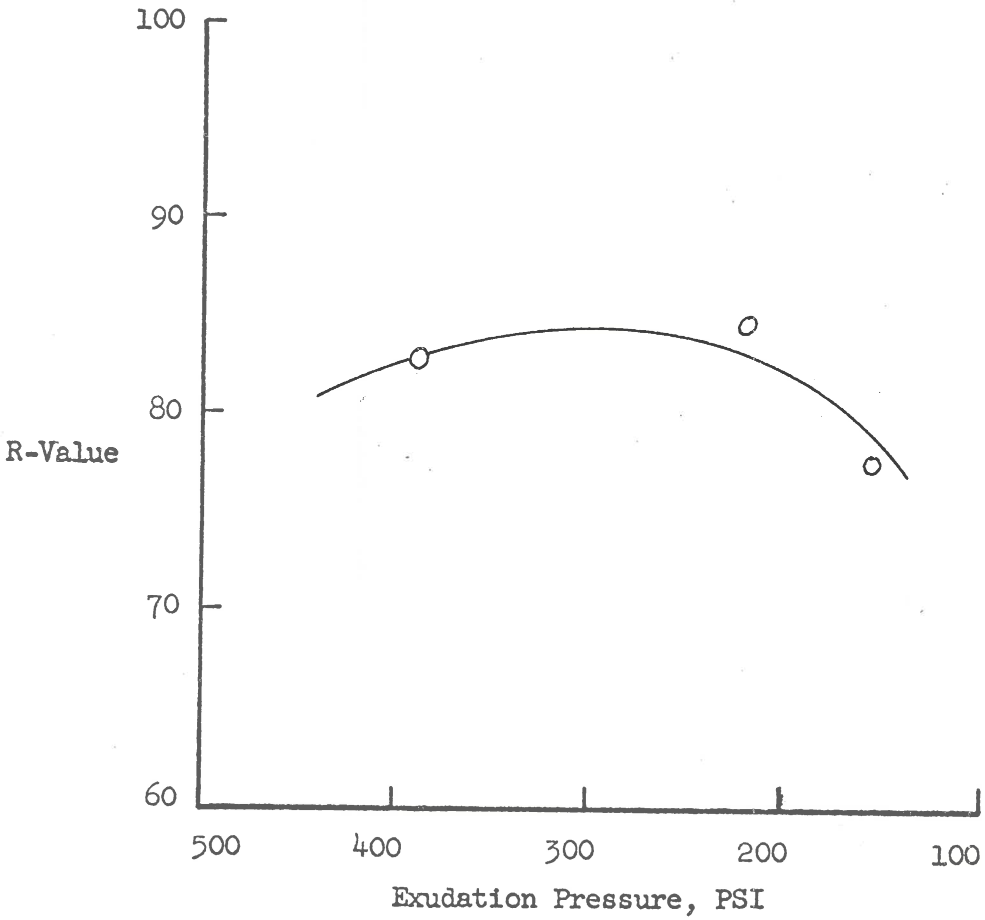
Summary of Data
California R-Value

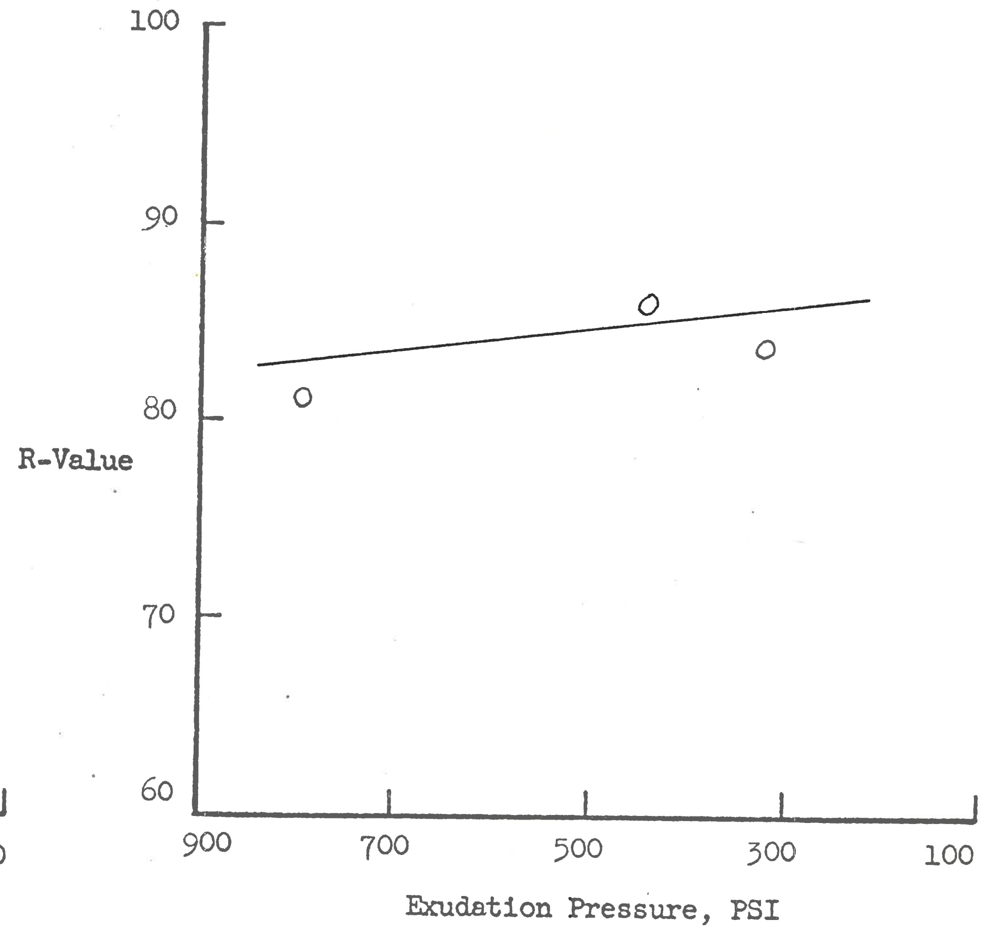
Sample No.: 541
Date Tested: 2-26-68
Visual Description: Sand

R-Value at 240 PSI: 84
R-Value at 300 PSI: 85

Sample No.: 542
Date Tested: 2-20-68
Visual Description: Crushed Limestone

R-Value at 240 PSI: 86
R-Value at 300 PSI: 86





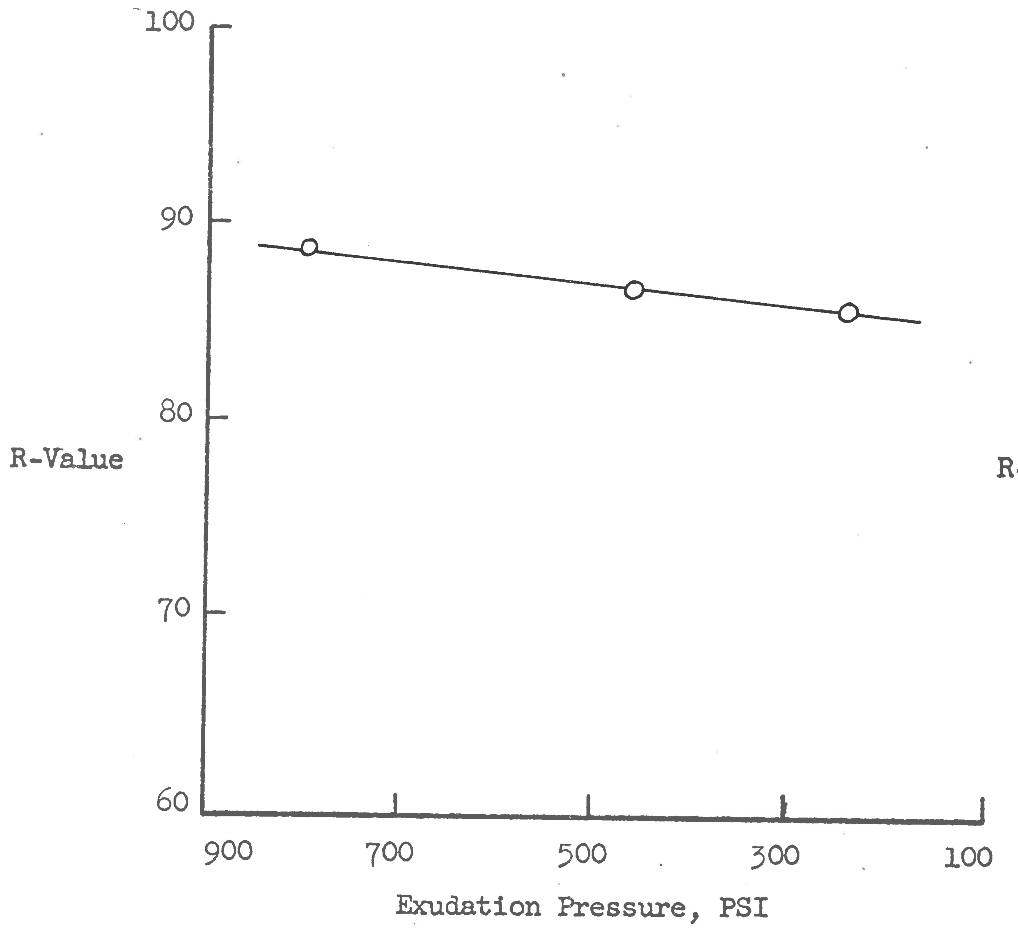
Summary of Data
California R-Value

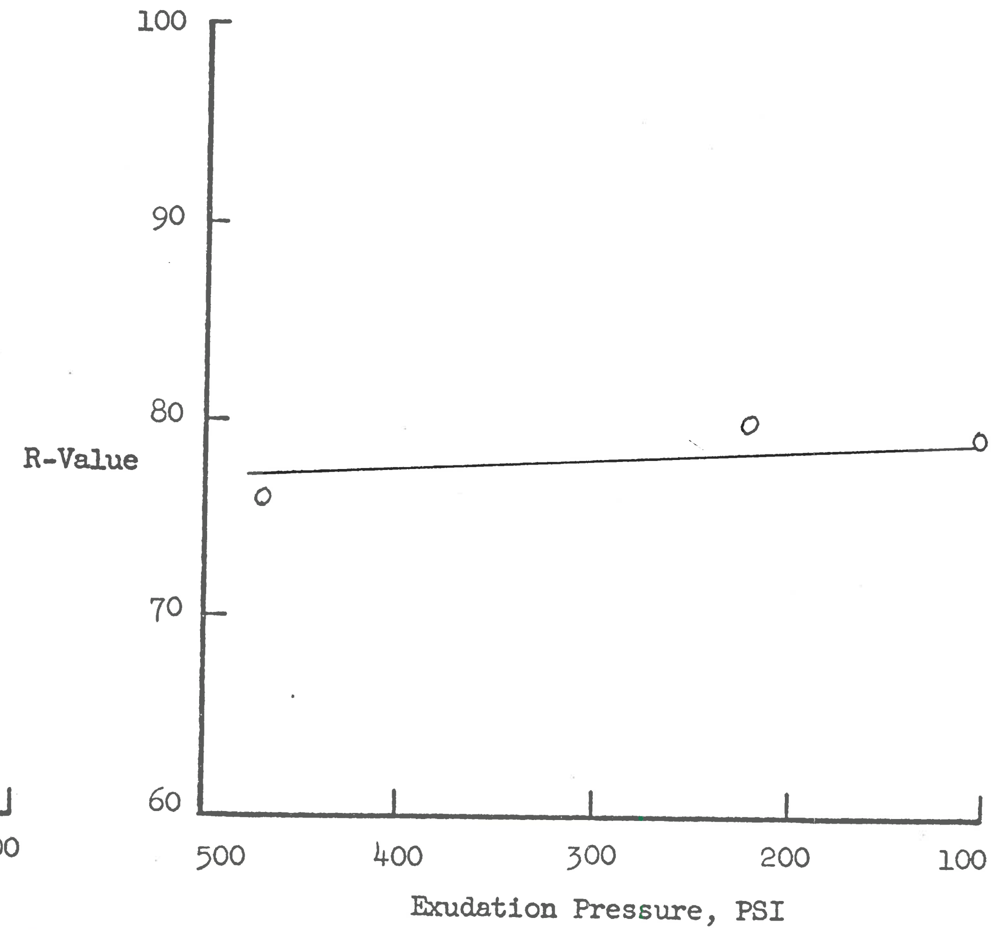
Sample No.: 543
Date Tested: 2-26-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 86
R-Value at 300 PSI: 86

Sample No.: 544
Date Tested: 2-26-68
Visual Description: Fine Sand

R-Value at 240 PSI: 78
R-Value at 300 PSI: 78

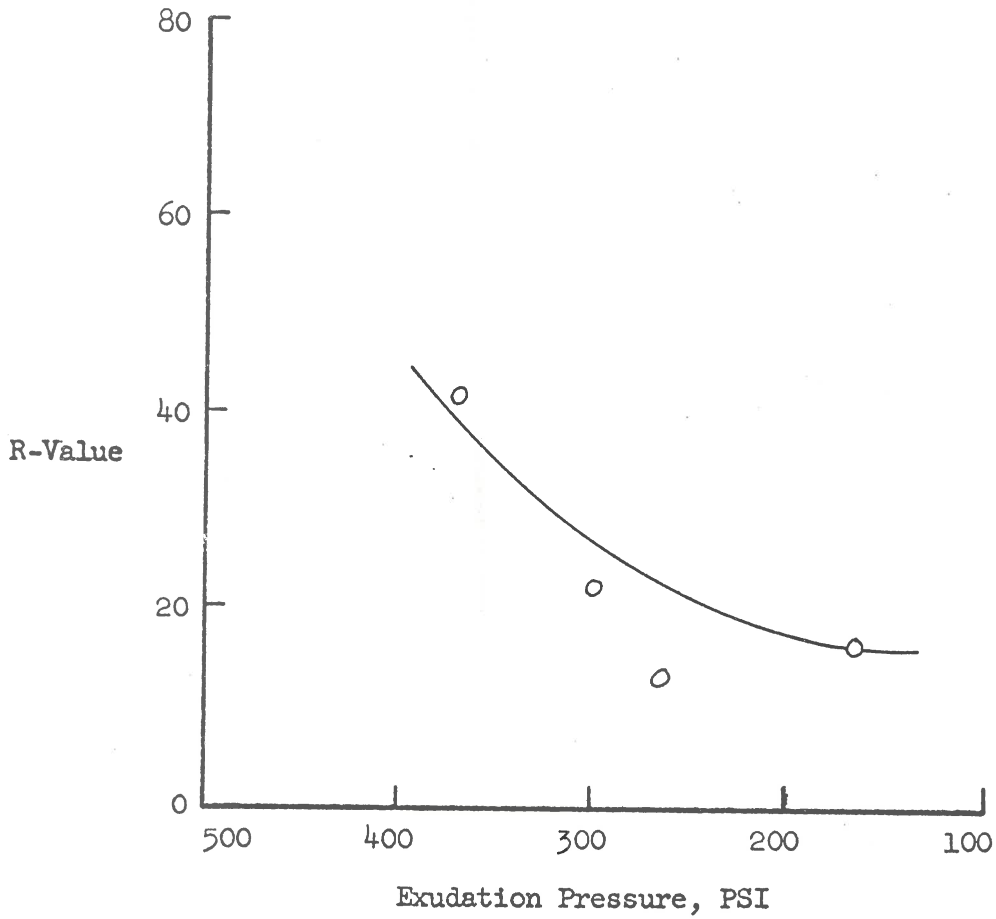




Summary of Data
California R-Value

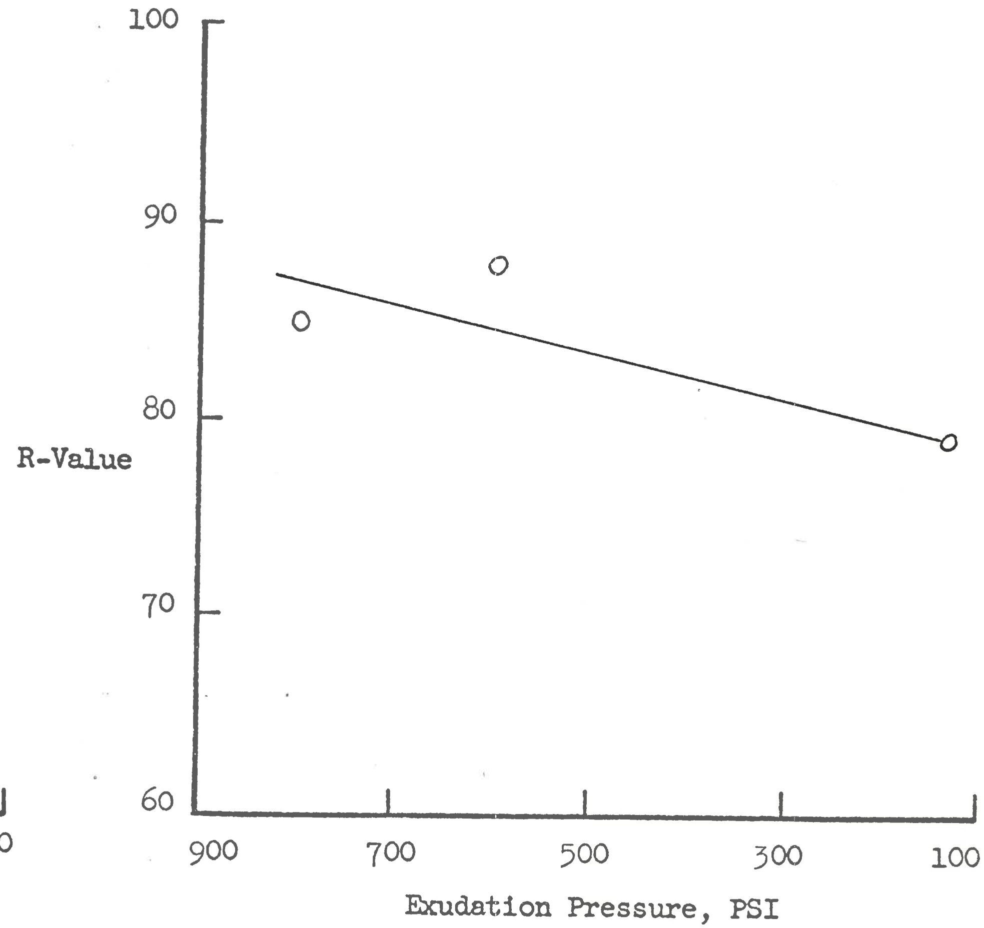
Sample No.: 545
Date Tested: 2-20-68
Visual Description: Yellow Silt

R-Value at 240 PSI: 21
R-Value at 300 PSI: 26



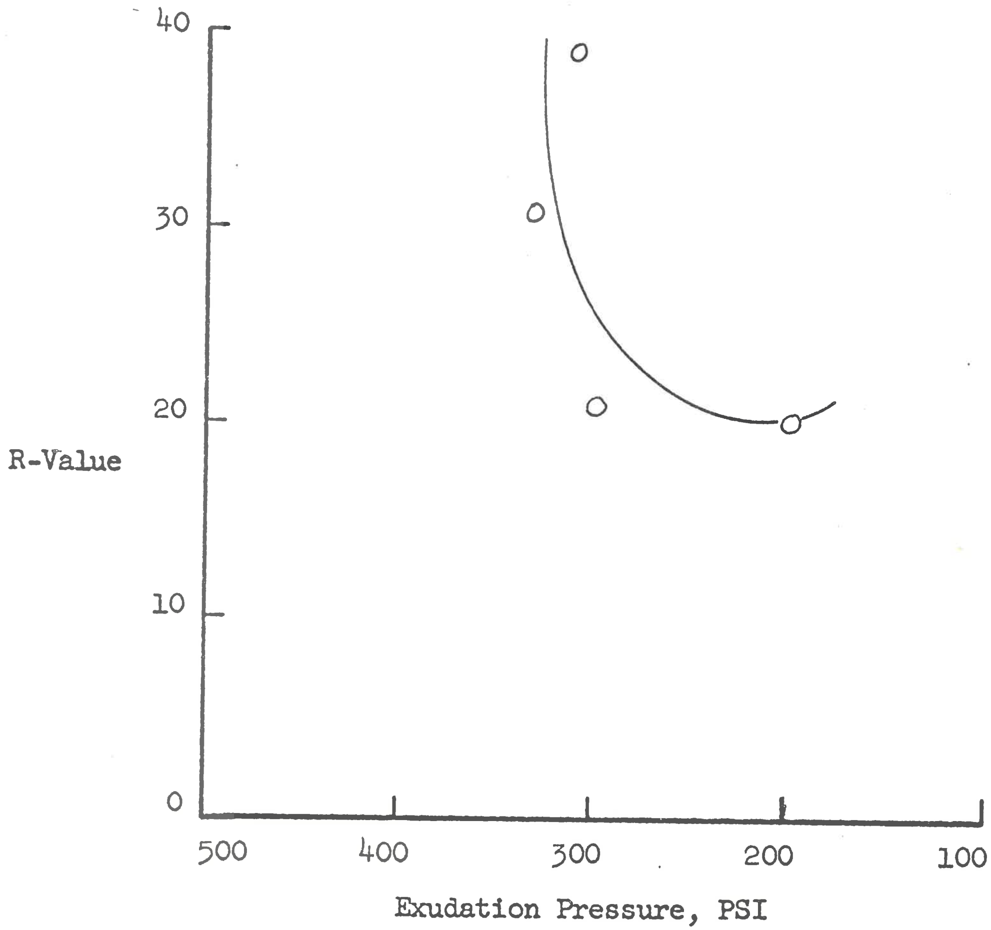
Sample No.: 546
Date Tested: 2-20-68
Visual Description: Fine Sand

R-Value at 240 PSI: 81
R-Value at 300 PSI: 81

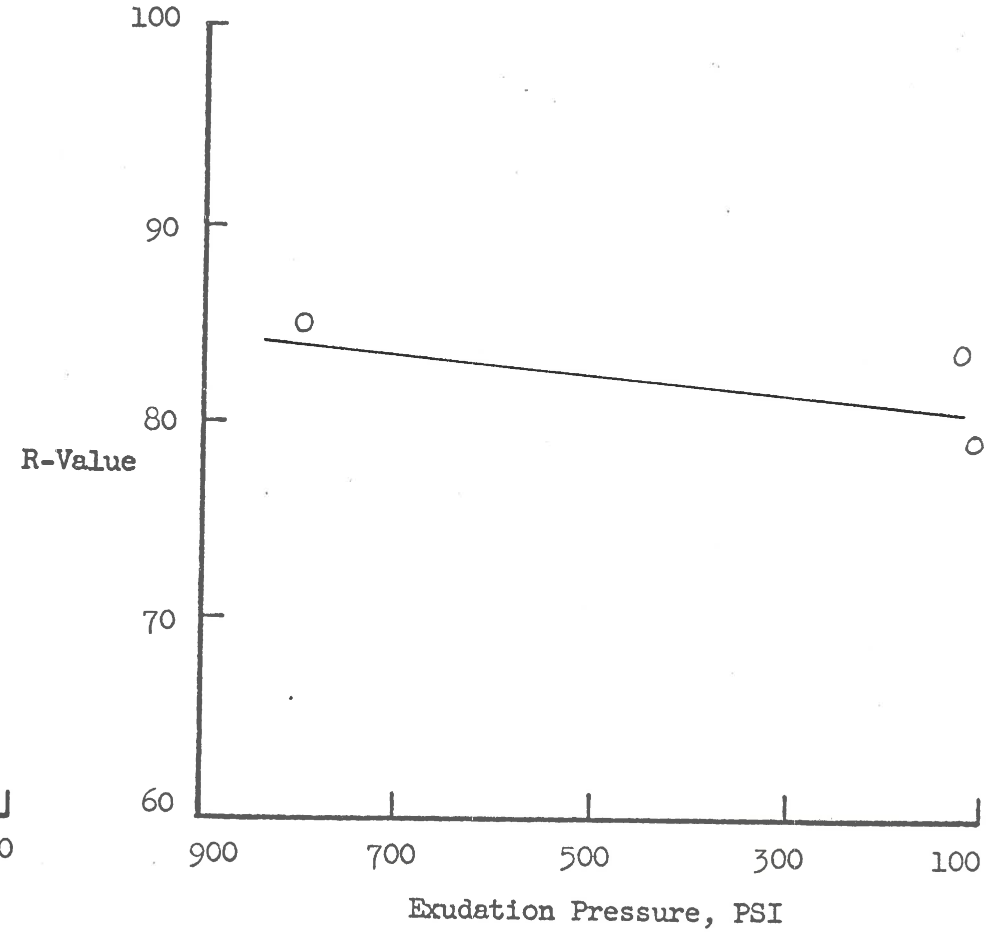


Summary of Data
California R-Value

Sample No.:	547
Date Tested:	2-20-68
Visual Description:	Brown Silt
R-Value at 240 PSI:	21
R-Value at 300 PSI:	25



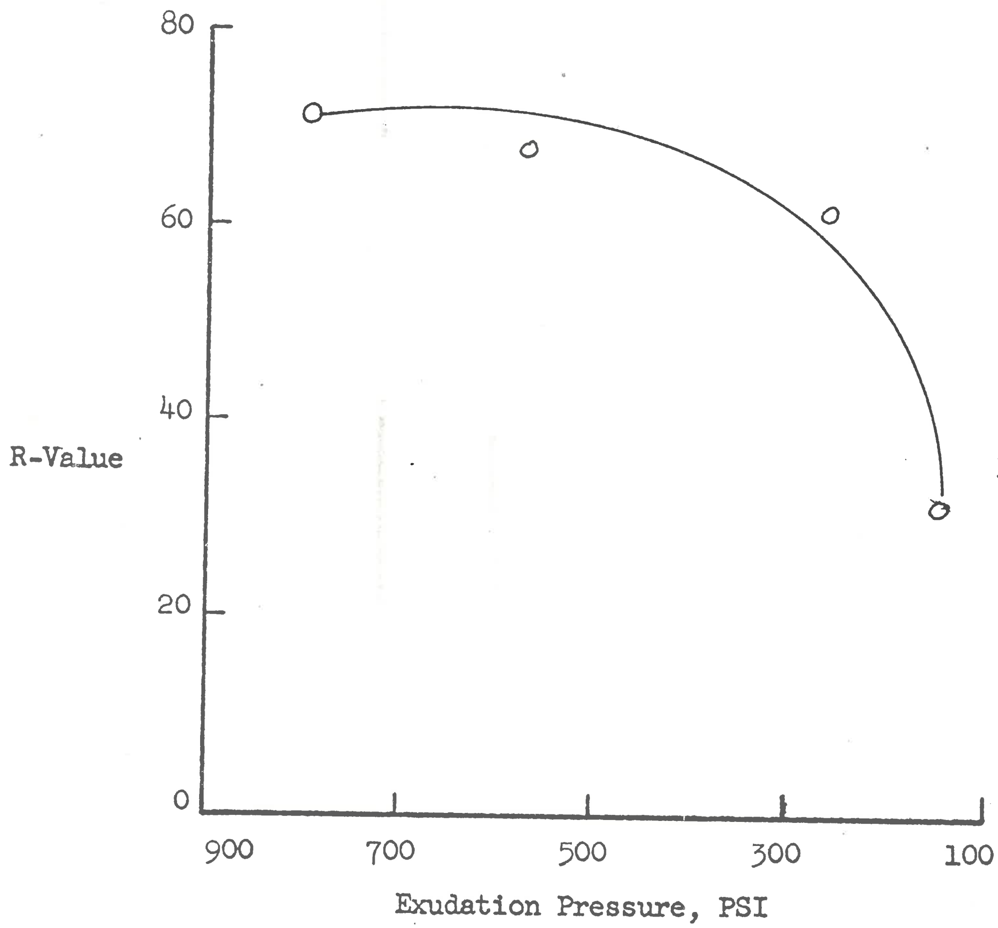
Sample No.:	548
Date Tested:	2-21-68
Visual Description:	Gravel and Sand
R-Value at 240 PSI:	82
R-Value at 300 PSI:	82



Summary of Data
California R-Value

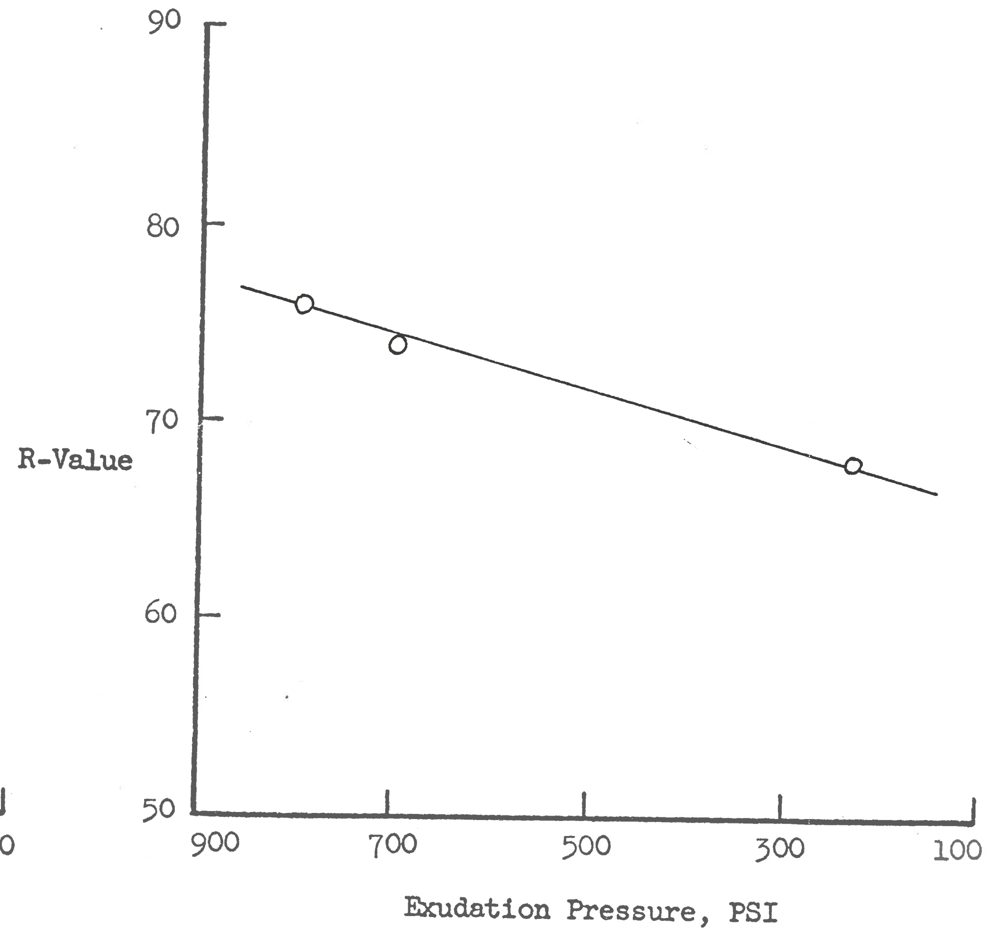
Sample No.: 549
Date Tested: 2-20-68
Visual Description: Brown Silt

R-Value at 240 PSI: 60
R-Value at 300 PSI: 63



Sample No.: 550
Date Tested: 2-21-68
Visual Description: Gravel and Fine Sand

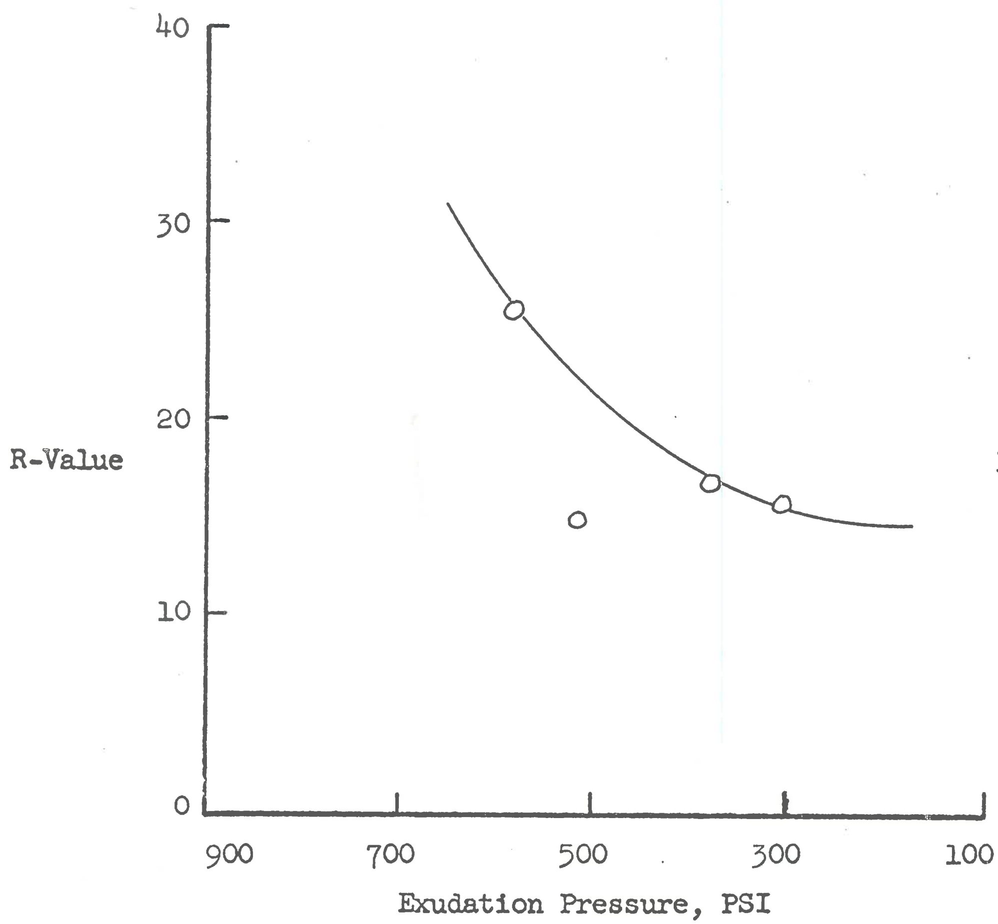
R-Value at 240 PSI: 68
R-Value at 300 PSI: 69



Summary of Data
California R-Value

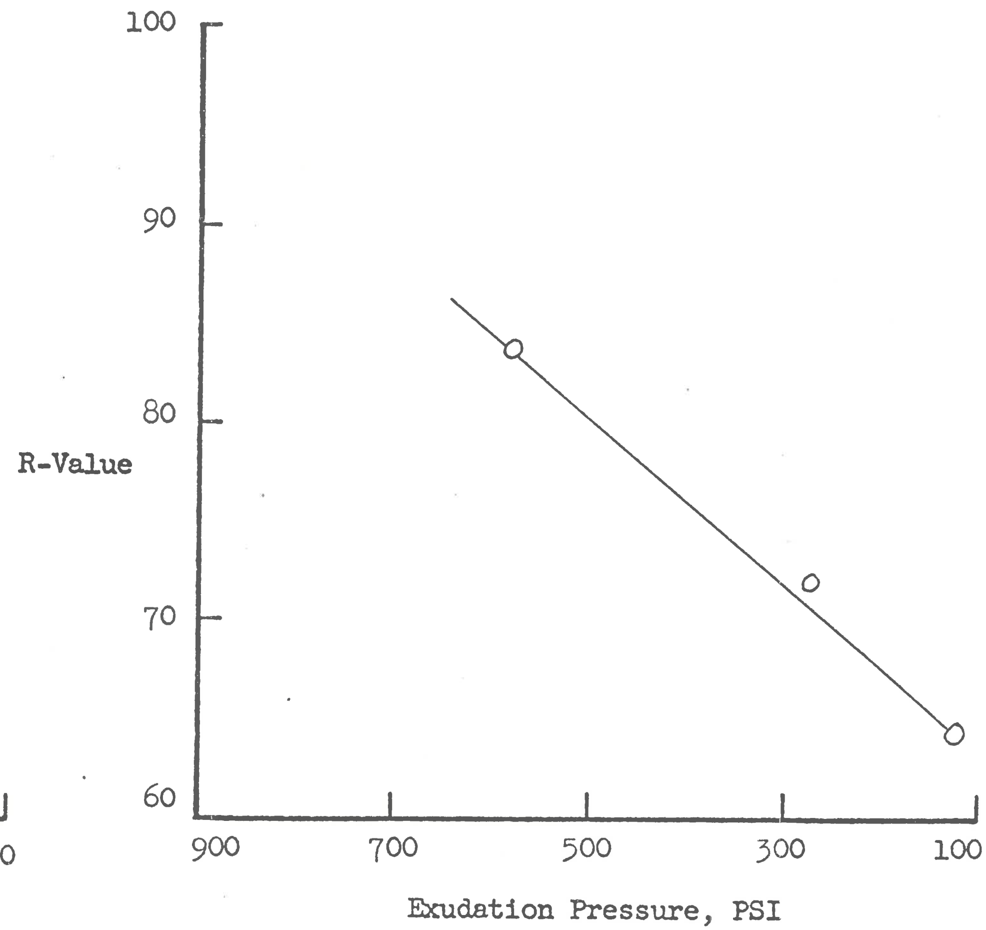
Sample No.: 551
Date Tested: 2-20-68
Visual Description: Sandy Clay

R-Value at 240 PSI: 15
R-Value at 300 PSI: 16



Sample No.: 552
Date Tested: 2-26-68
Visual Description: Gravel and Fine Sand

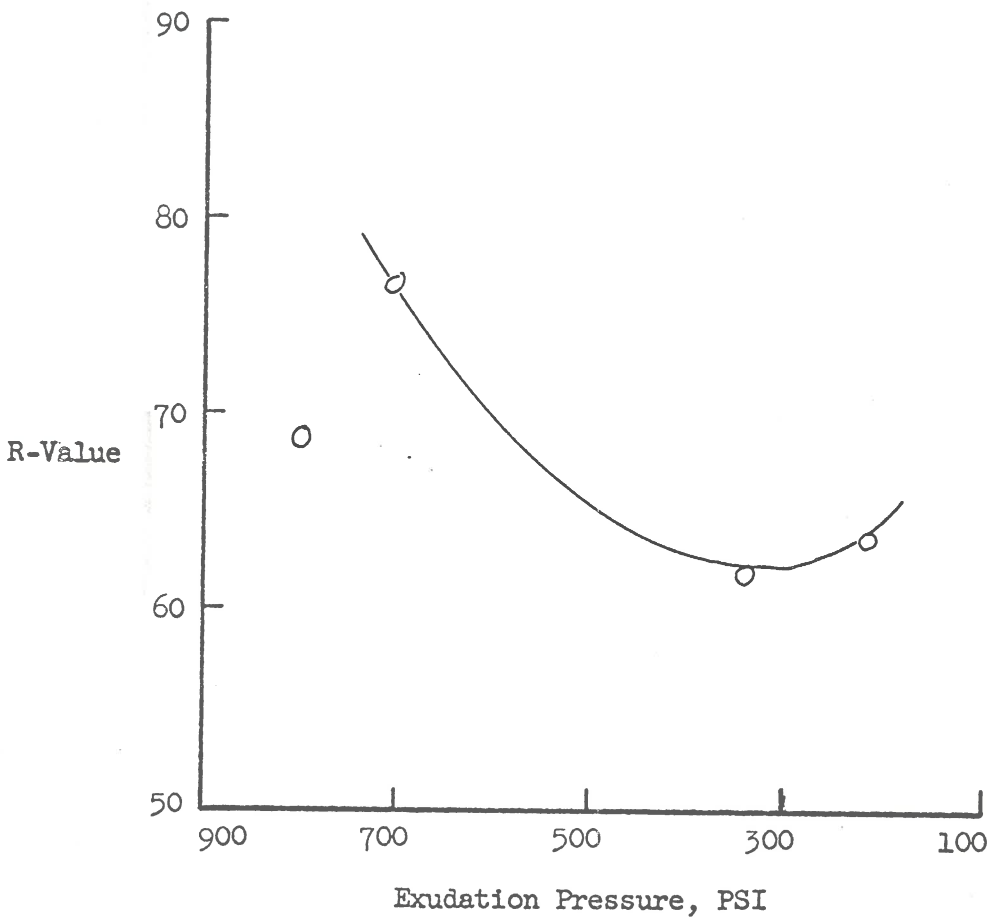
R-Value at 240 PSI: 70
R-Value at 300 PSI: 72



Summary of Data
California R-Value

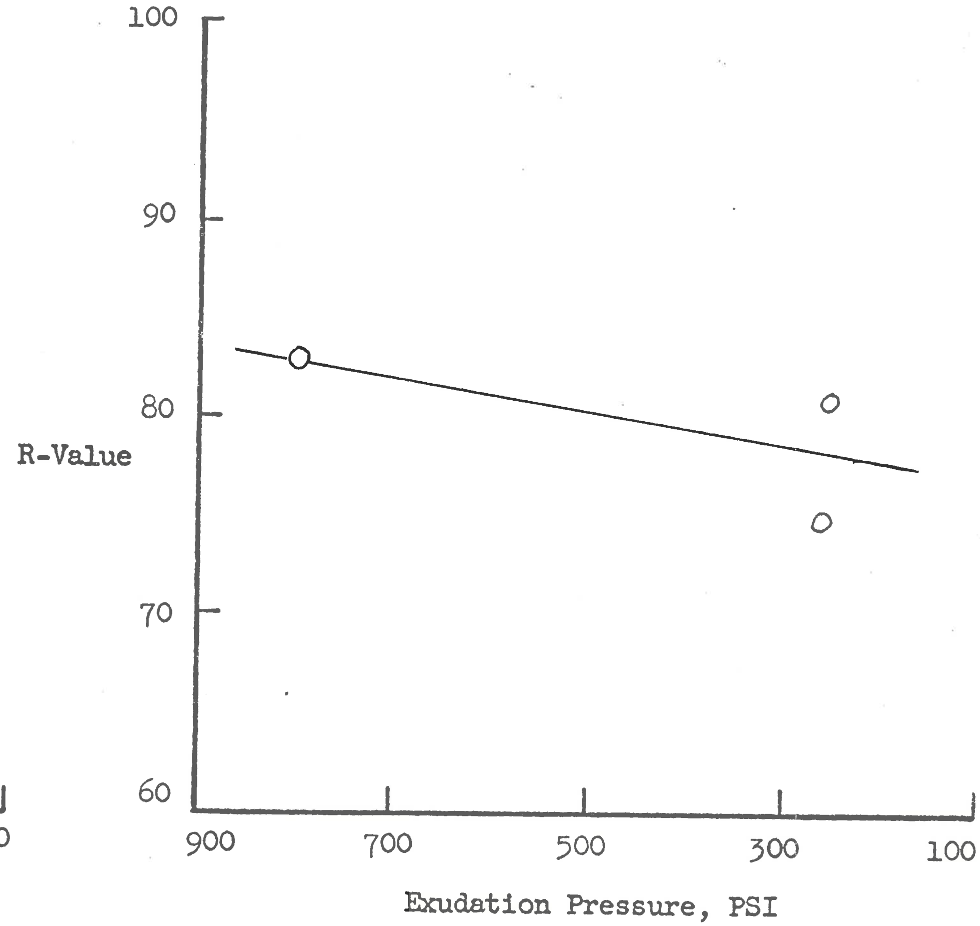
Sample No.: 553
Date Tested: 2-20-68
Visual Description: Gray Silt

R-Value at 240 PSI: 63
R-Value at 300 PSI: 62



Sample No.: 554
Date Tested: 2-20-68
Visual Description: Gravel and Fine Sand

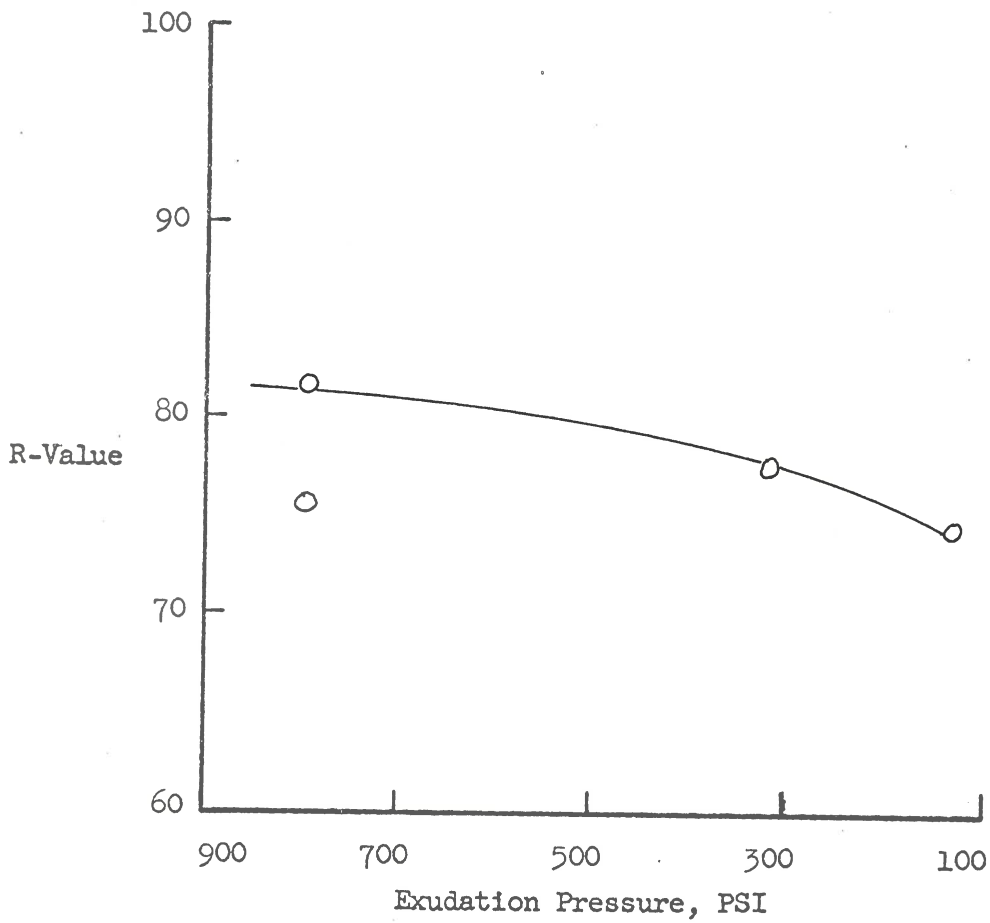
R-Value at 240 PSI: 78
R-Value at 300 PSI: 79



Summary of Data
California R-Value

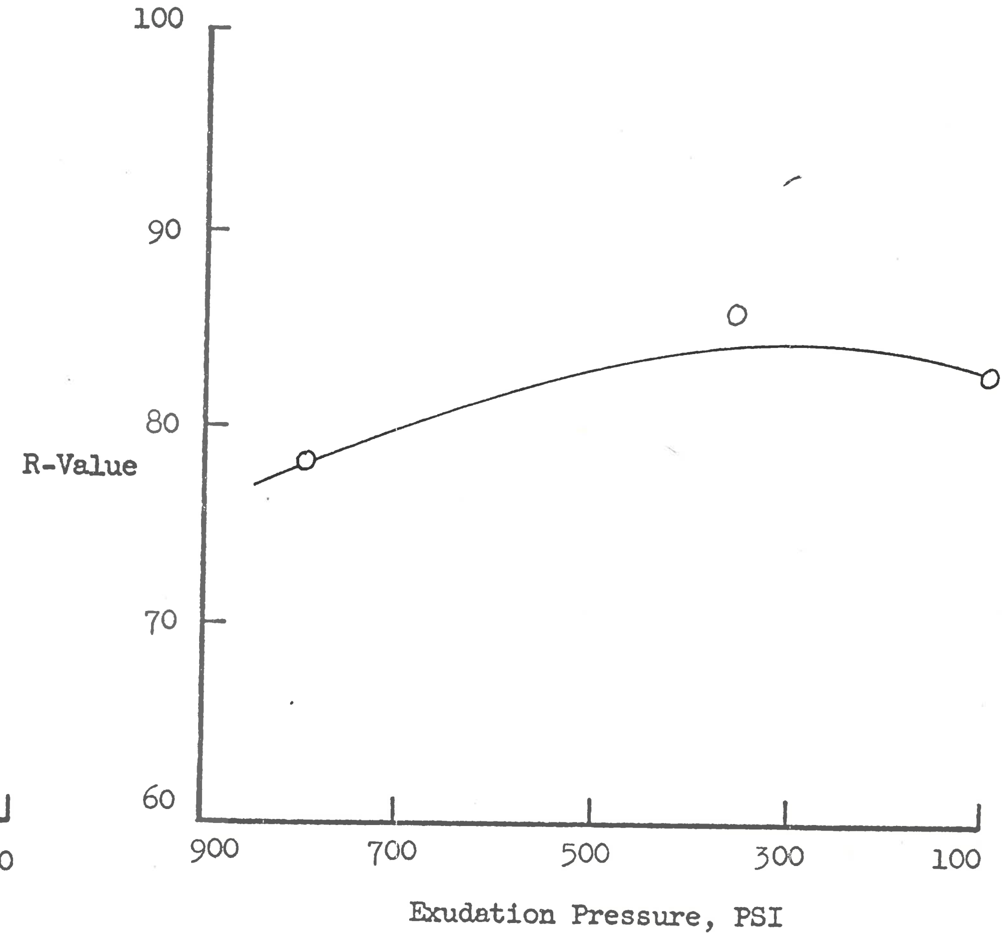
Sample No.: 555
Date Tested: 2-20-68
Visual Description: Gray Silt

R-Value at 240 PSI: 77
R-Value at 300 PSI: 77



Sample No.: 556
Date Tested: 2-20-68
Visual Description: Silty Sand

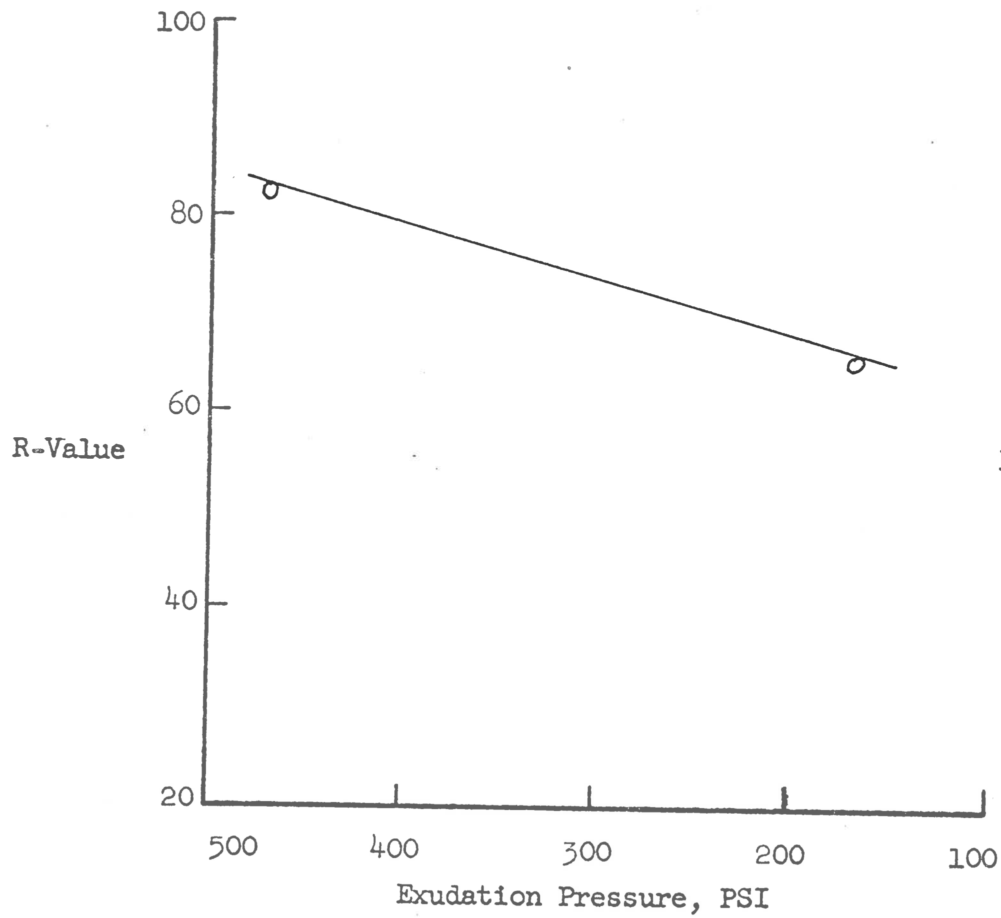
R-Value at 240 PSI: 84
R-Value at 300 PSI: 84



Summary of Data
California R-Value

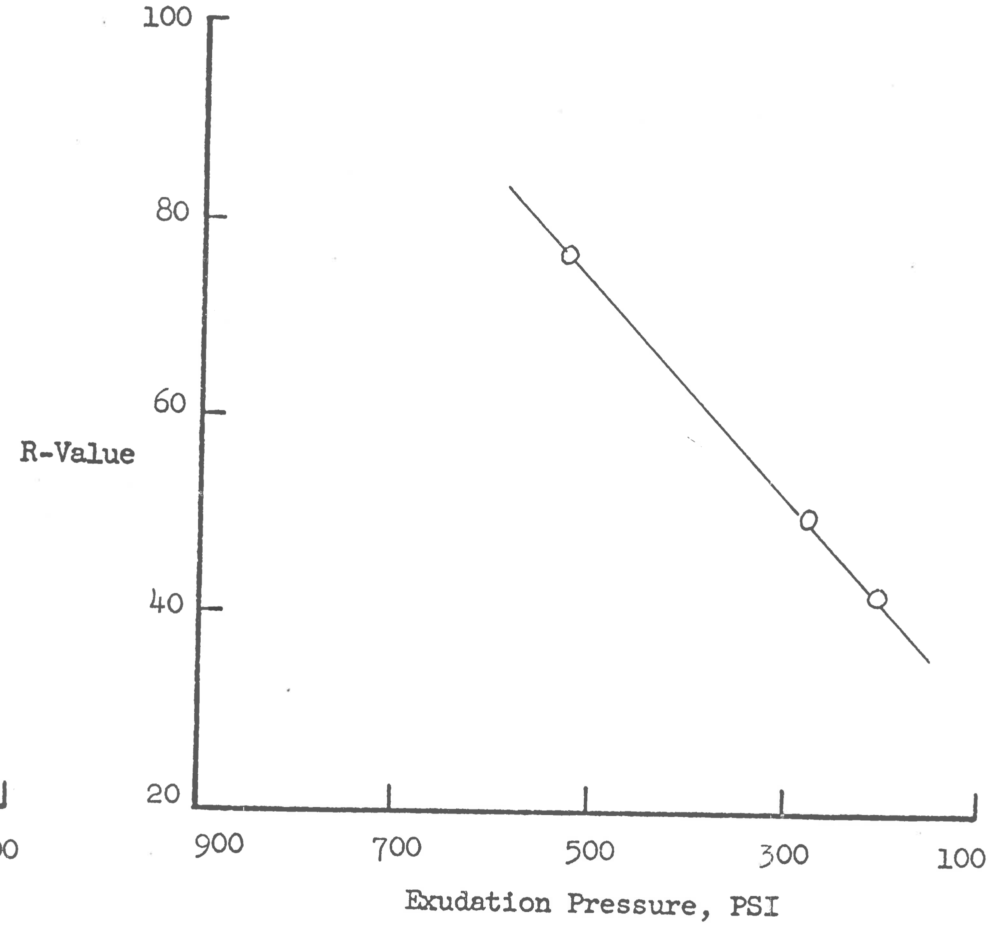
Sample No.: 557
Date Tested: 2-20-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 72
R-Value at 300 PSI: 76



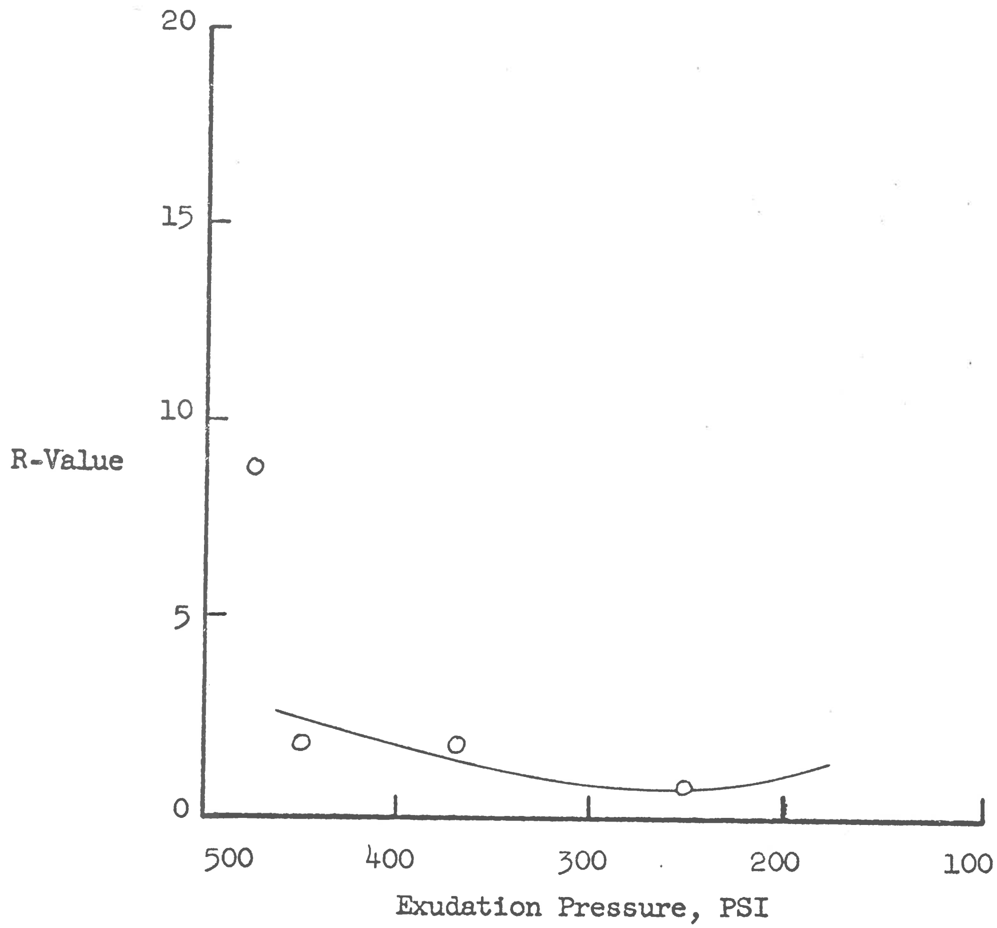
Sample No.: 558
Date Tested: 2-20-68
Visual Description: Clayey Silt

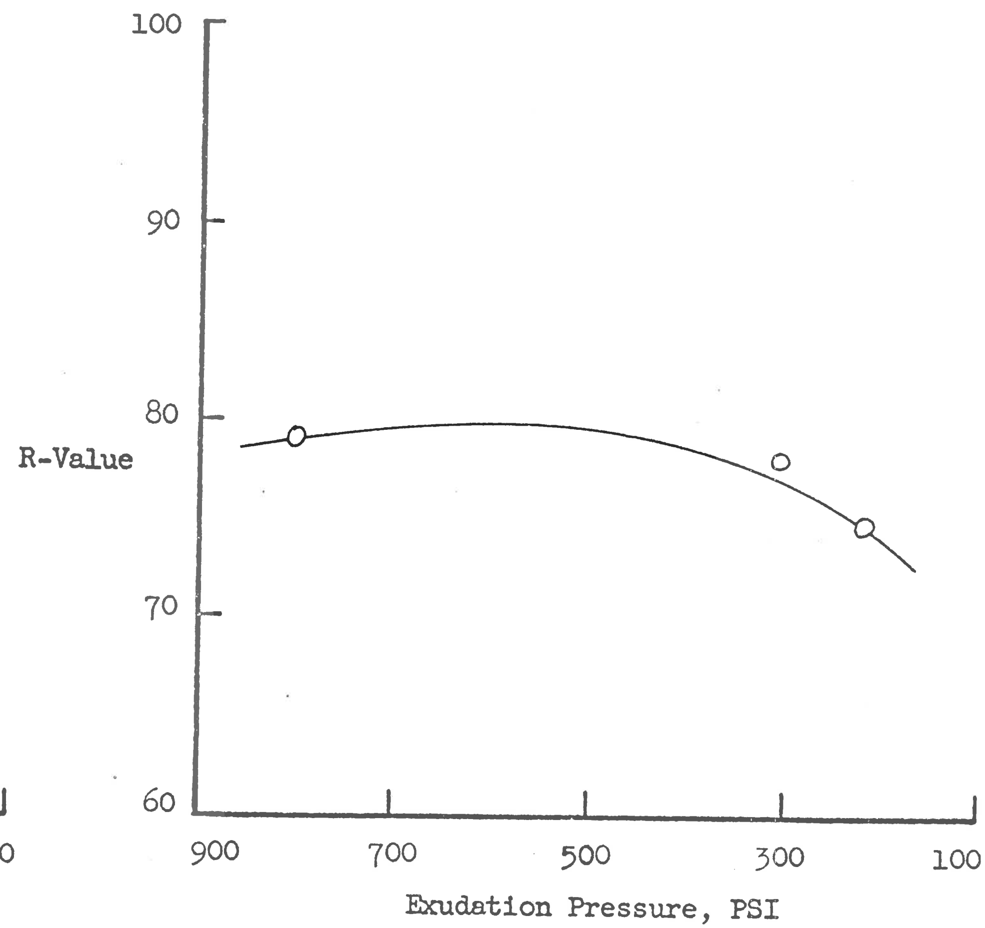
R-Value at 240 PSI: 46
R-Value at 300 PSI: 53



Summary of Data
California R-Value

Sample No.:	559	Sample No.:	560
Date Tested:	2-20-68	Date Tested:	2-20-68
Visual Description:	Clayey Sand	Visual Description:	Silty Sand with Gravel
R-Value at 240 PSI:	01	R-Value at 240 PSI:	76
R-Value at 300 PSI:	01	R-Value at 300 PSI:	77

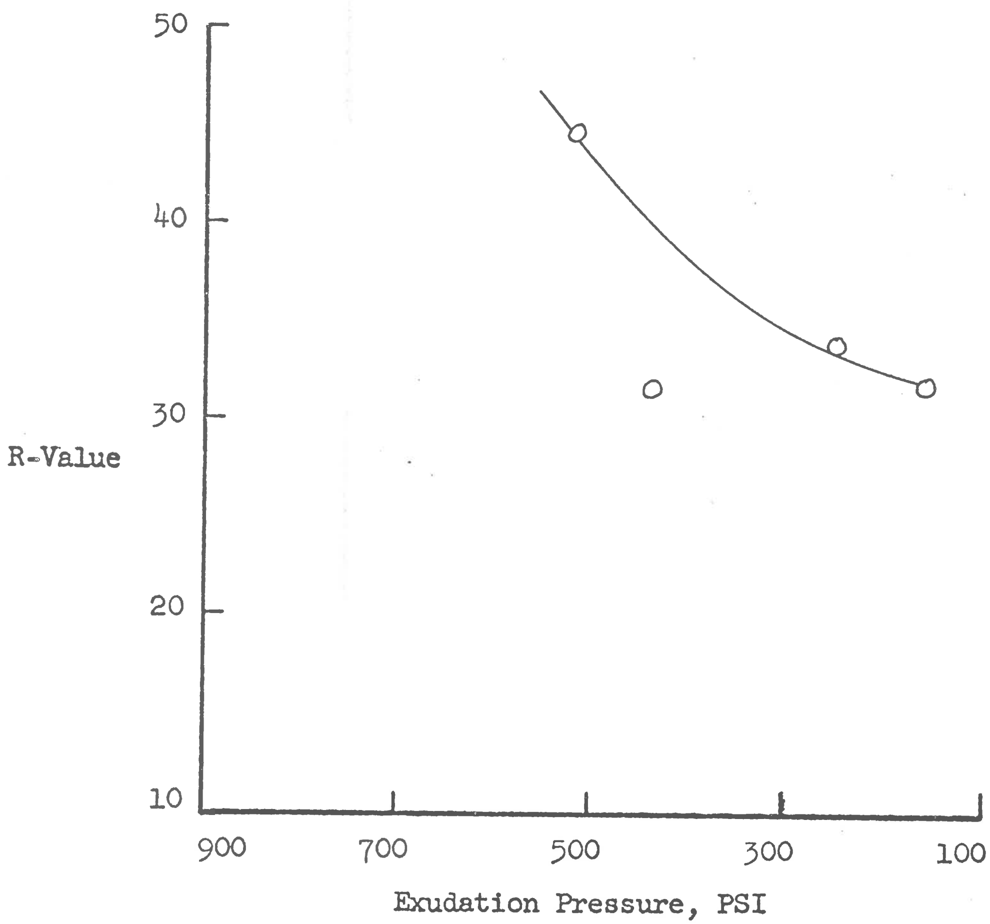




Summary of Data
California R-Value

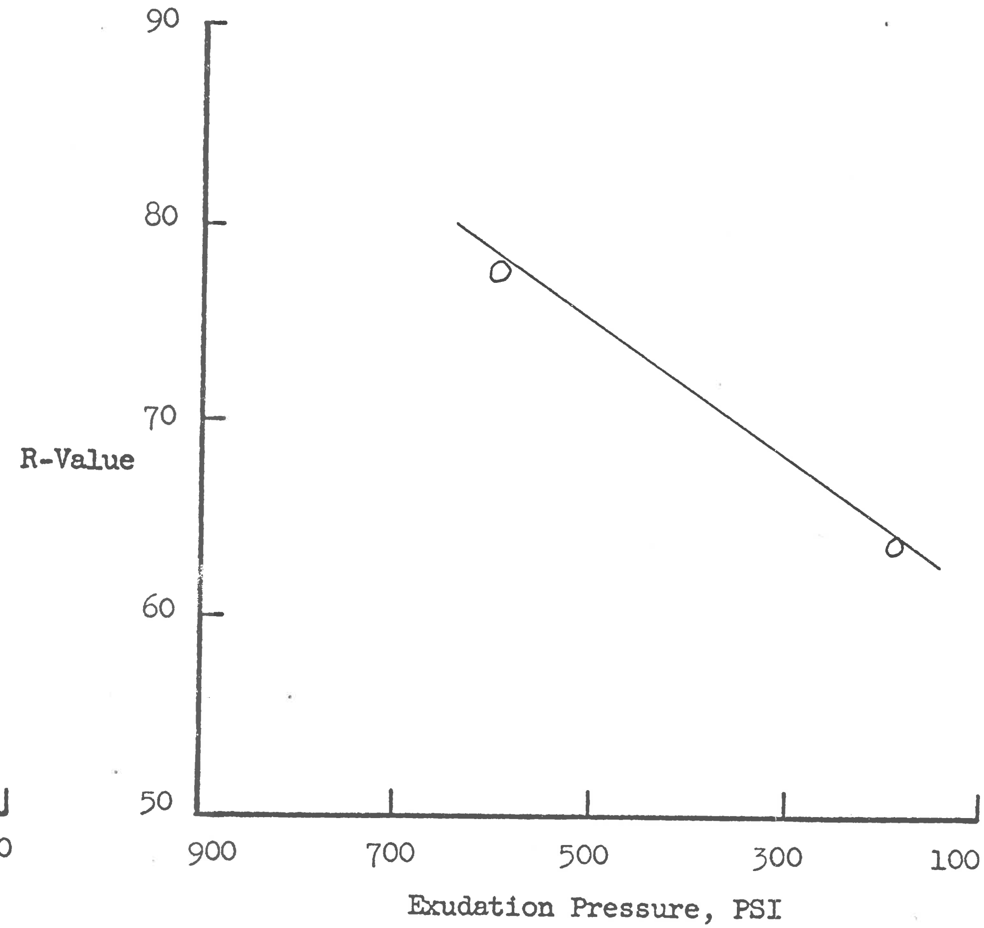
Sample No.: 561
Date Tested: 2-20-68
Visual Description: Yellow Silt

R-Value at 240 PSI: 33
R-Value at 300 PSI: 34



Sample No.: 562
Date Tested: 2-20-68
Visual Description: Silty Sand with Gravel

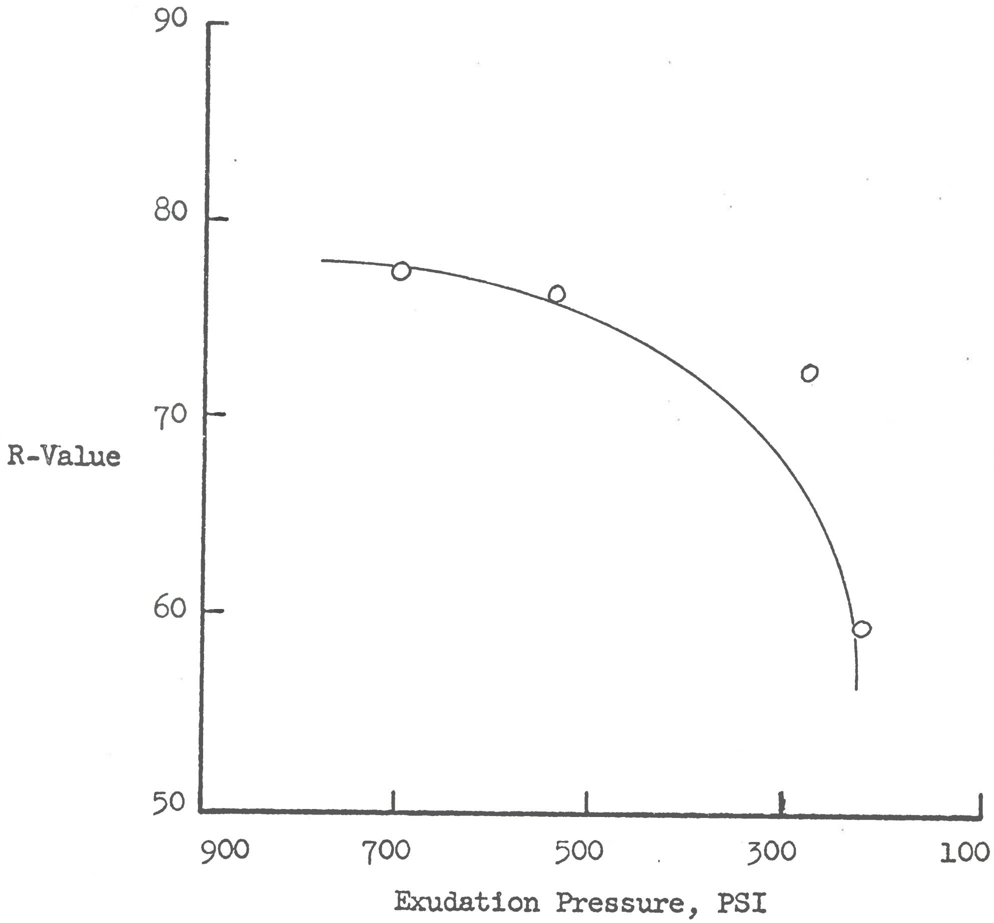
R-Value at 240 PSI: 67
R-Value at 300 PSI: 70



Summary of Data
California R-Value

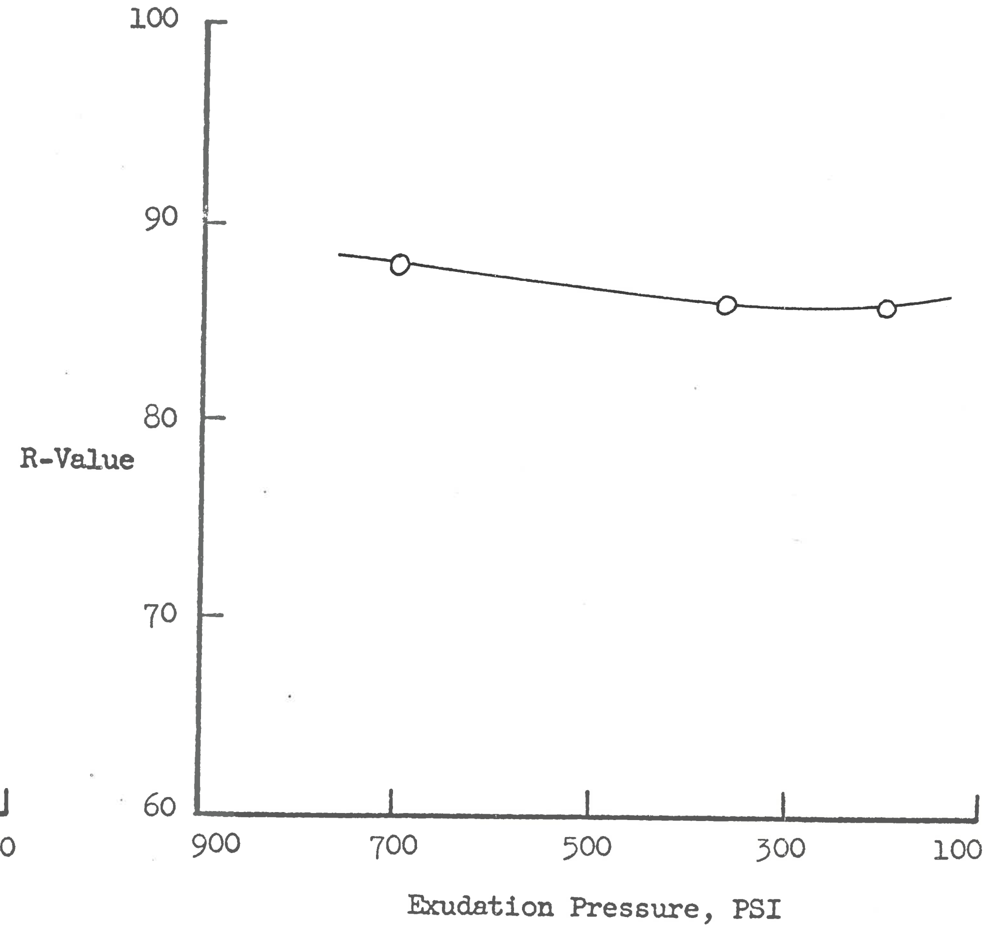
Sample No.: 563
Date Tested: 2-20-68
Visual Description: Clayey Sand

R-Value at 240 PSI: 62
R-Value at 300 PSI: 70



Sample No.: 564
Date Tested: 2-26-68
Visual Description: Fine Sand

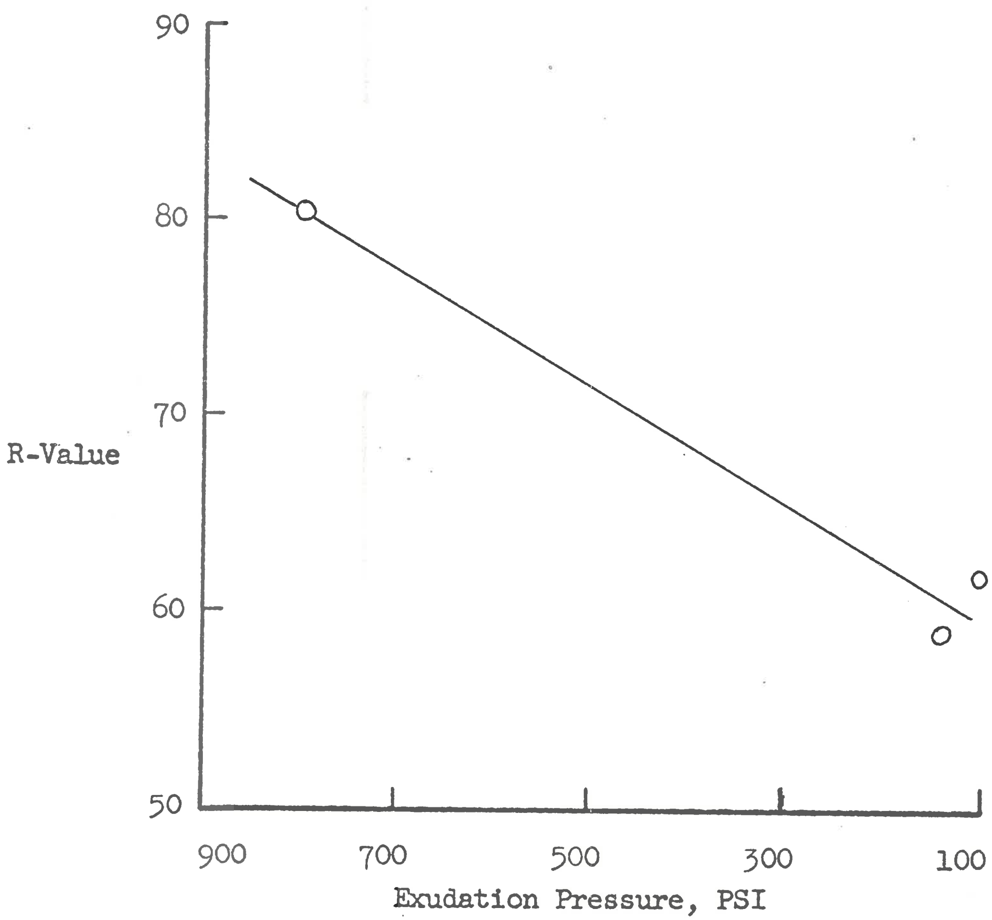
R-Value at 240 PSI: 86
R-Value at 300 PSI: 86



Summary of Data
California R-Value

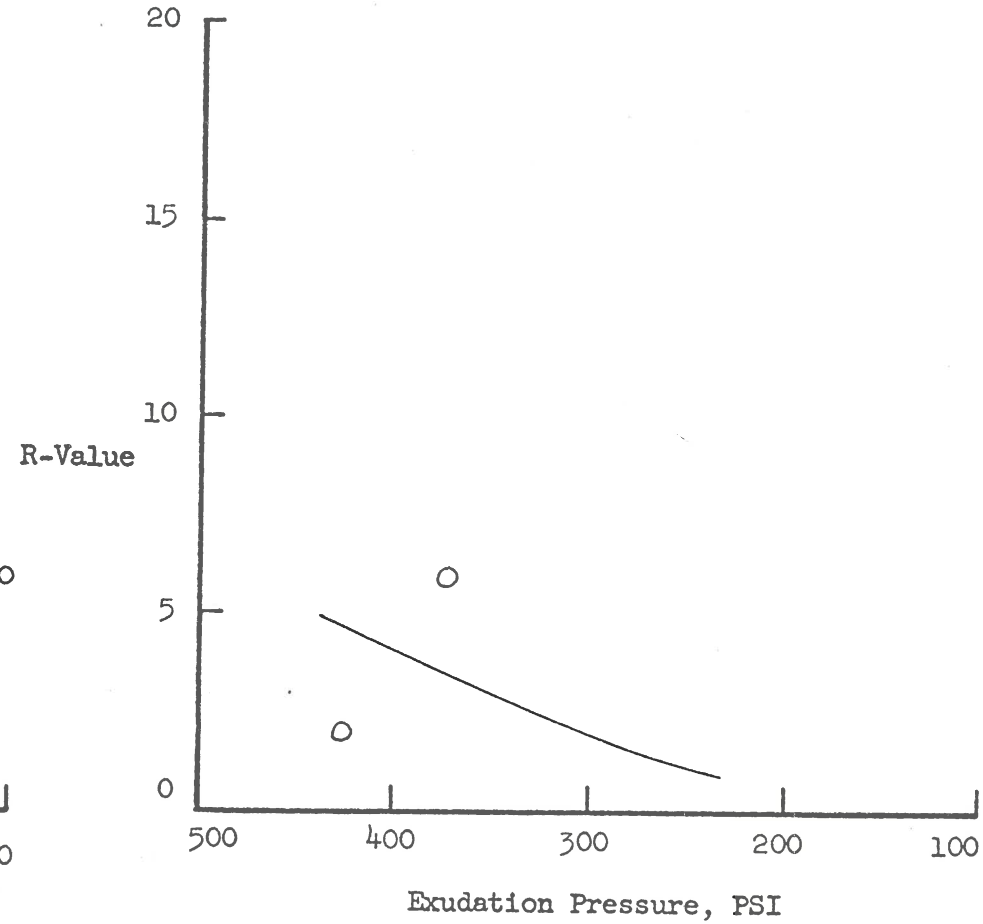
Sample No.: 565
Date Tested: 2-20-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 64
R-Value at 300 PSI: 66



Sample No.: 566
Date Tested: 2-20-68
Visual Description: Black Clay

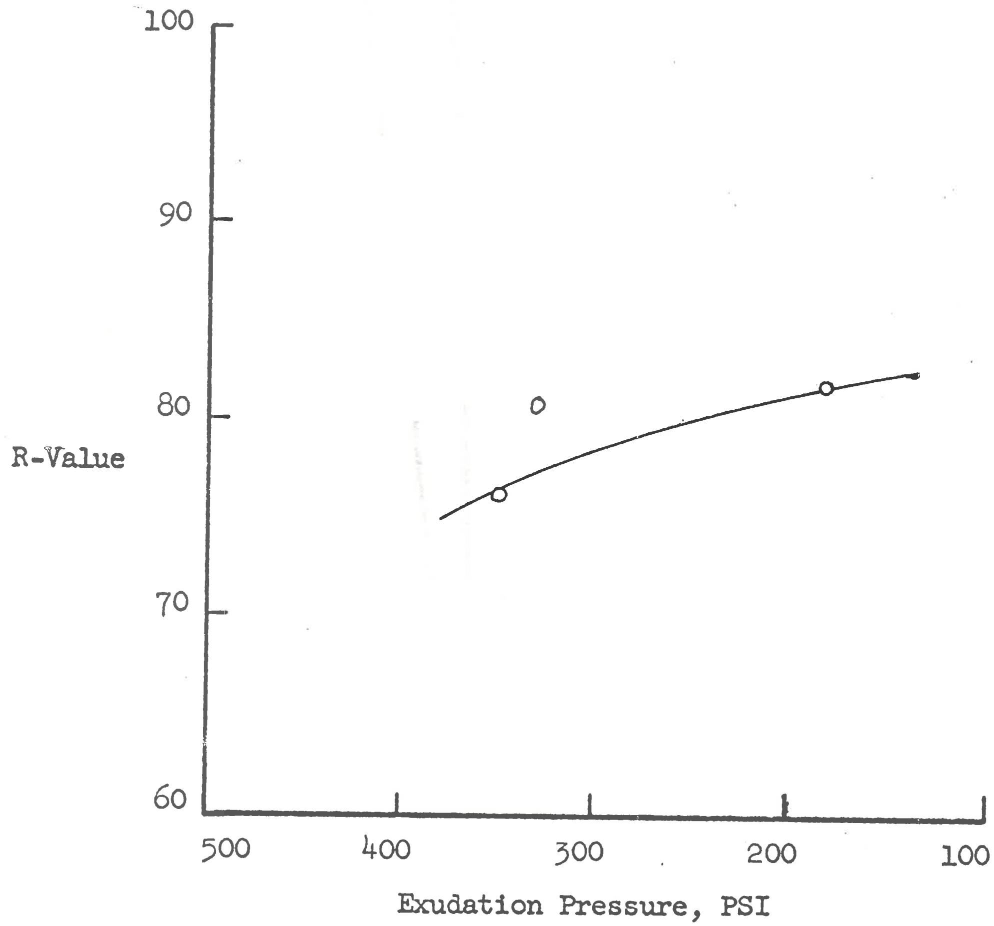
R-Value at 240 PSI: 01
R-Value at 300 PSI: 02



Summary of Data
California R-Value

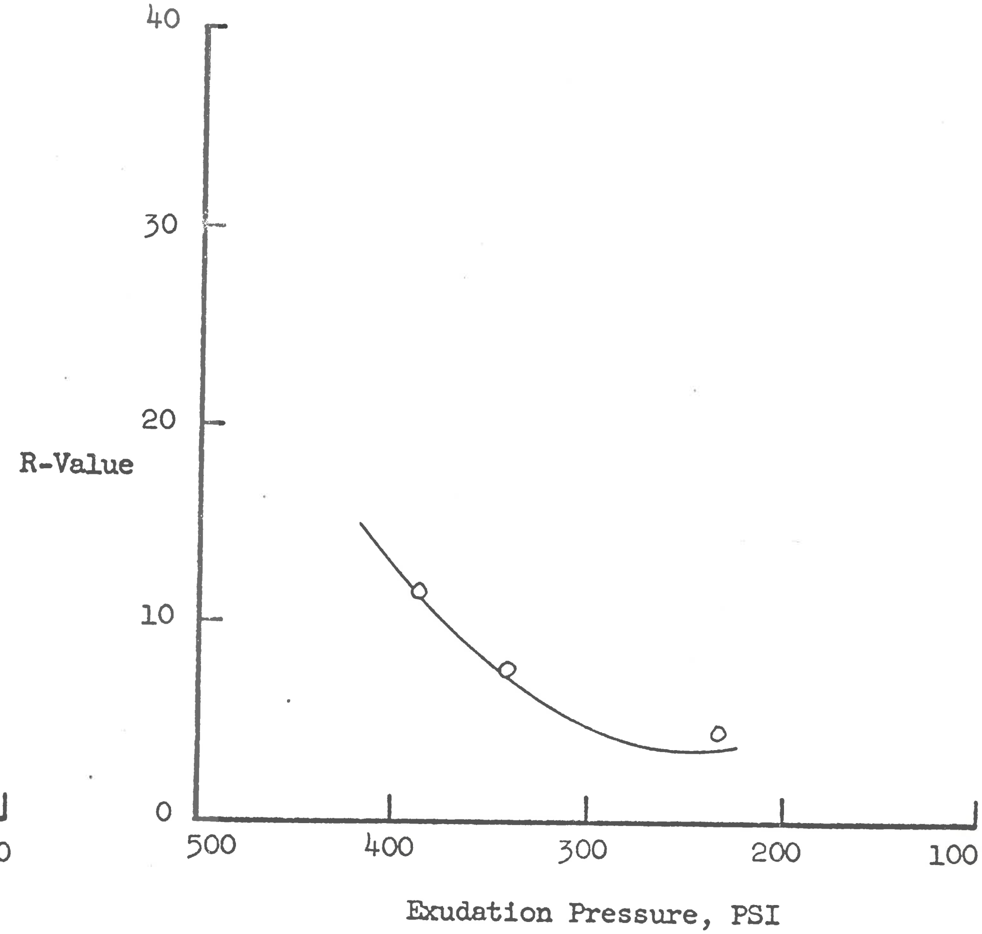
Sample No.: 567
Date Tested: 2-21-68
Visual Description: Gravel and Sand

R-Value at 240 PSI: 81
R-Value at 300 PSI: 79



Sample No.: 568
Date Tested: 2-20-68
Visual Description: Black Clay

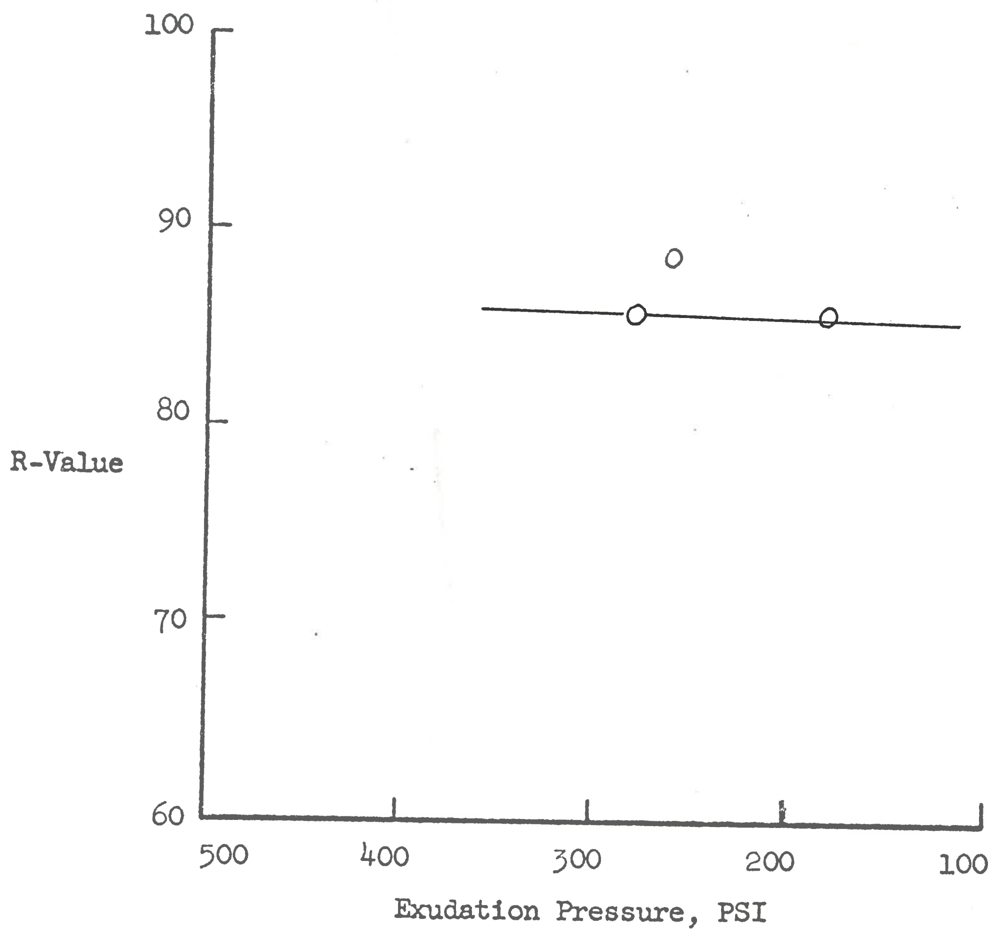
R-Value at 240 PSI: 04
R-Value at 300 PSI: 05



Summary of Data
California R-Value

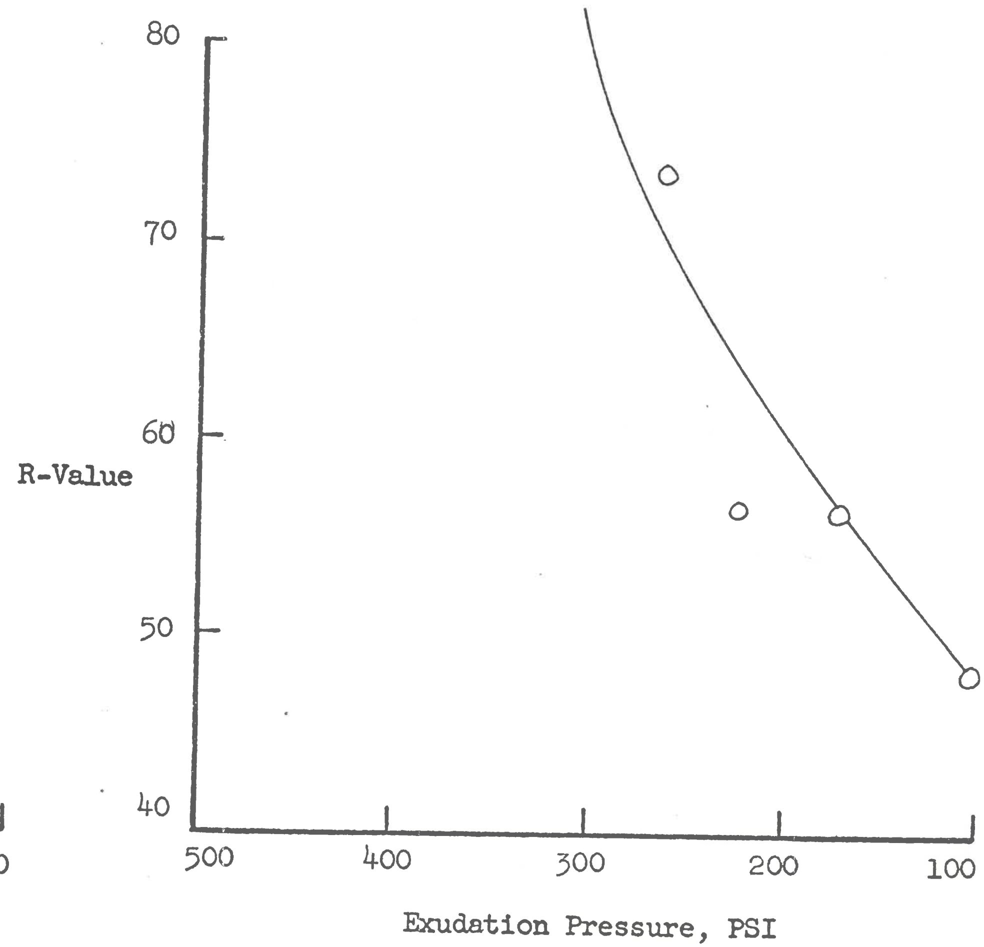
Sample No.: 569
Date Tested: 2-21-68
Visual Description: Sand

R-Value at 240 PSI: 86
R-Value at 300 PSI: 86



Sample No.: 570
Date Tested: 2-20-68
Visual Description: Sand

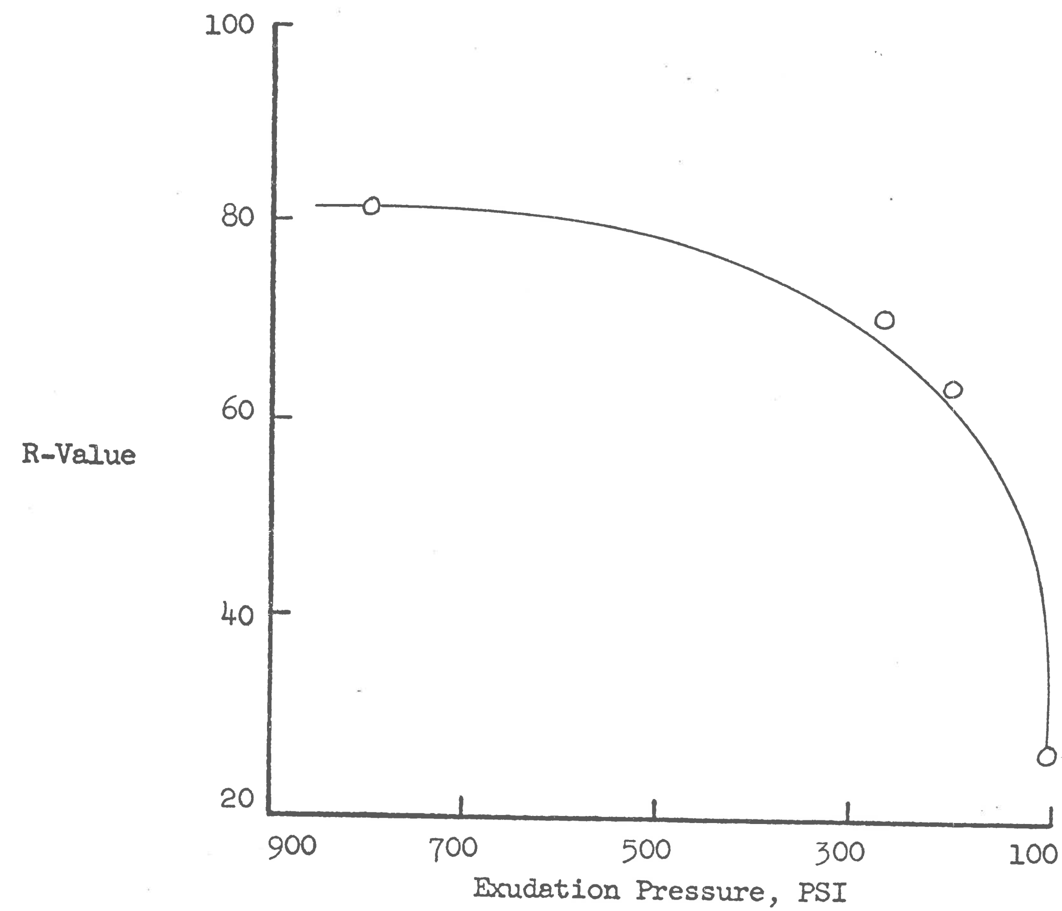
R-Value at 240 PSI: 67
R-Value at 300 PSI: 80



Summary of Data
California R-Value

Sample No.: 571
Date Tested: 2-20-68
Visual Description: Silty Sand

R-Value at 240 PSI: 67
R-Value at 300 PSI: 72



Appendix - B

SUBGRADE AND BASE CHARACTERISTICS - PLASTICITY

Listed in Appendix - B are the index properties for all plastic and non-plastic soil samples taken in Phase I, II, and III of Highway Research Project No. 20. All samples are listed in numerical order in two groups - plastic soils and non-plastic soils. The first group of samples are the plastic soils followed by the non-plastic soils. For each soil sample, the sample number, the date the sample was tested, a visual description of the soil sample, the liquie limit (LL), the plastic limit (PL), the plasticity index (PI), the flow index, the coefficient of uniformity (C_u), and the coefficient of gradation (C_g) are shown. Table B-1 is an example of how index properties are listed in Appendix - B:

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
003	2-4-65	Clayey silt	48.4	24.7	23.7	38.7	-----	-----

Table B-1

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
003	2-4-65	Clayey Silt	48.4	24.7	23.7	38.7	------	------
005	1-29-65	Tan Clay	33.6	18.4	15.2	30.2	------	------
007	1-26-65	Tan Sandy Clay	31.9	18.7	13.2	9.2	------	------
008	1-26-65	Tan Clayey Sand	26.6	21.3	5.3	8.2	------	------
009	1-27-65	Slightly Sandy Clay	33.3	20.5	12.8	12.7	------	------
010	1-27-65	Brownish-tan Clay	36.5	23.2	13.3	15.0	------	------
011	1-27-65	Tan Clay with trace of Silt	55.3	23.3	32.0	13.5	------	------
012	1-29-65	Red Silty Clay	80.9	34.3	46.6	49.3	------	------
013	1-28-65	Brown Clay-Silt	28.8	25.0	3.8	7.7	------	------
014	1-28-65	Grayish Clay	74.9	37.7	37.2	18.8	------	------
015	1-30-65	Red Clayey Sand	17.6	17.1	0.5	7.5	------	------
016	2-1-65	Tannish Brown Sandy Clay	30.2	16.5	13.7	13.3	------	------
017	1-29-65	Tan Sandy Clay	40.8	21.6	19.2	17.6	------	------

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
018	1-28-65	Brown Sandy Clay	48.9	29.0	19.9	17.8	------	------
019	1-28-65	Tan Silty Clay	34.3	20.7	13.6	12.1	------	------
020	1-28-65	Tan Sandy Clay	27.2	22.5	4.7	8.2	------	------
021	1-28-65	Tan Sandy Clay	28.5	20.9	7.6	7.0	------	------
022	1-29-65	Brown Silty Clay	36.7	24.9	11.8	15.9	------	------
023	1-28-65	Gray Sandy Silt	28.0	19.8	8.2	6.1	------	------
024	1-29-65	Tan Clay	46.3	19.9	26.4	21.6	------	------
025	1-29-65	Tan Clay	57.2	24.7	32.5	22.3	------	------
026	2-1-65	Tan Sandy Clay	34.8	19.3	15.5	17.6	------	------
027	2-1-65	Yellowish Tan Sandy Clay	34.7	20.4	14.3	14.0	------	------
028	2-1-65	Red Clay	71.1	37.6	33.5	29.6	------	------
029	2-2-65	Red Sandy Clay	56.5	32.2	24.3	17.6	------	------
030	2-2-65	Brown Silty Clay	86.3	39.6	46.7	9.4	------	------
031	1-29-65	Tan Silty Clay	37.8	28.5	9.3	16.4	------	------
032	2-3-65	Brown Sandy Clay	28.9	23.3	5.6	9.4	------	------

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
033	2-3-65	Tan Sandy Clay	32.6	20.5	12.1	14.0	------	------
034	2-3-65	Tan Sandy Clay	32.6	21.7	10.9	9.4	------	------
035	2-3-65	Tan Sandy Clay	57.0	31.8	25.2	18.3	------	------
036	1-30-65	Reddish Brown Clay	62.4	36.9	25.5	21.0	------	------
037	2-3-65	Brown Silty Clay	20.8	18.8	2.0	3.5	------	-------
038	2-3-65	Brown Silty Clay	39.2	30.5	8.7	5.4	------	------
039	2-5-65	Tan Silty Clay	34.5	24.8	9.7	9.8	------	------
044	2-4-65	Red Sandy Clay	27.3	20.9	6.4	5.4	------	------
045	2-8-65	Tan Silty Clay	20.5	19.0	1.5	3.8	------	------
049	2-11-65	Red Sandy Clay	29.3	21.8	7.5	7.7	------	------
050	2-11-65	Tan Sandy Clay	28.2	17.3	10.9	13.4	------	------
051	2-8-65	Red Sandy Clay	37.4	21.3	16.1	14.1	------	------
053	2-15-65	Brown Sandy Clay	33.5	22.6	10.9	12.4	------	------
054	2-11-65	Tan Sandy Clay	37.6	20.5	17.1	15.2	------	------
055	2-16-65	Red Sand with Clay	28.4	21.3	7.1	3.5	------	------

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
056	2-22-65	Red Clay	32.6	21.5	11.1	15.5	------	------
057	2-16-65	Tan Sandy Clay	71.1	27.9	43.2	24.6	------	------
061	2-23-65	Red Sandy Clay	21.5	17.1	4.4	9.4	------	------
062	2-22-65	Tan Silty Clay	41.3	19.0	22.3	16.0	------	------
064	3-1-65	Tan Silty Clay	25.9	19.2	6.7	11.7	------	------
065	2-23-65	Tan Clayey Sand	24.0	20.1	3.9	9.9	------	------
066	2-22-65	Tan Clay	47.3	23.1	24.2	18.8	------	------
067	2-23-65	Tan Clayey Sand	29.7	22.9	6.8	3.5	------	------
068	3-1-65	Tan Clay	48.4	22.2	26.2	9.4	------	------
069	3-4-65	Brownish Gray Clay	32.8	21.8	11.0	6.6	------	------
070	3-2-65	Tan Clayey Sand	36.4	23.2	13.2	16.4	------	------
072	3-2-65	Red Clayey Sand	31.1	18.1	13.0	12.2	------	------
073	3-2-65	Brownish Silty Clay	76.9	31.6	45.3	10.1	------	------
075	3-4-65	Brown Silty Clay	66.5	24.6	41.9	27.0	------	------

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
076	3-8-65	Brown Clay	85.6	37.5	48.1	26.8	------	------
079	3-8-65	Red Clayey Silt	24.7	22.8	1.9	3.5	------	------
080	3-9-65	Reddish Brown Clay	71.5	28.0	43.5	18.8	------	------
082	3-15-65	Brown Sandy Clay	59.4	22.4	37.0	23.2	------	------
083	3-15-65	Tan Silty Clay	59.6	26.5	33.1	7.0	------	------
084	3-8-65	Red Sandy Clay	30.2	21.2	9.0	5.8	------	------
085	3-11-65	Red Sandy Clay	27.2	20.2	7.0	10.3	------	------
089	3-15-65	Tan Sandy Clay	45.6	23.9	21.7	16.4	------	------
093	6-16-65	Tan Sandy Clay	47.9	24.3	23.6	19.5	------	------
094	6-16-65	Tan Sandy Clay	47.9	24.3	23.6	19.5	------	------
099	5-4-65	Red Sandy Clay	26.8	18.3	8.5	12.4	------	------
100	5-17-65	Red Sandy Clay	29.3	22.5	6.8	13.1	------	------
103	5-21-65	Tan Clay	36.1	19.9	16.2	16.3	------	------
104	5-21-65	Tan Clay	44.3	19.3	25.0	19.8	------	------

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
105	5-3-65	Red Silty Clay	36.8	23.0	13.8	12.9	------	------
106	5-21-65	Brown Clay	65.6	29.5	36.1	23.5	------	------
108	5-21-65	Red Sandy Clay	24.3	18.9	5.4	8.9	------	------
109	5-7-65	Red Clayey Silt	27.0	22.2	4.8	17.8	------	------
110	6-2-65	Red Sandy Clay	28.8	19.0	9.8	15.3	------	------
112	5-20-65	Red Clay	37.6	26.8	10.8	8.2	------	------
119	5-7-65	Red Silty Clay	29.7	15.3	14.4	8.5	------	------
125	6-2-65	Red Clayey Sand	17.4	15.6	1.8	10.1	34.48	0.880
127	6-18-65	Tan Clay	35.5	25.9	9.6	21.1	------	------
128	8-2-65	Brown Clay	71.5	36.4	35.1	16.4	------	------
129	6-22-65	Tan Sandy Clay	74.2	35.6	38.6	12.9	------	------
130	6-17-65	Brown Clay	70.2	34.9	35.3	17.8	------	------
131	7-1-65	Dark Tan Clay	105.6	37.3	68.3	42.3	------	------
133	6-30-65	Red Clay	51.6	21.5	30.1	18.8	------	------

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
134	5-18-65	Gray Silt	31.1	26.0	5.1	15.3	------	------
135	6-24-65	Red Clay	78.6	29.2	49.4	17.3	------	------
136	6-30-65	Light Brown Clay	77.7	30.2	47.5	5.9	------	------
137	6-8-65	Tan Clay	56.6	25.1	31.5	13.1	------	------
138	7-1-65	Tan Clay	26.7	23.2	3.5	9.4	------	------
139	6-25-65	Tan Clay	86.4	29.0	57.4	24.8	------	------
140	6-8-65	Dark Tan Clay	52.8	22.6	30.2	23.4	------	------
141	5-18-65	Tan Clayey Sand	29.1	23.8	5.3	15.5	------	------
154	7-8-65	Red Clay with Gravel	34.7	25.0	9.7	13.6	------	------
155	9-10-65	Dark Tan Clay with Gravel	28.7	21.9	6.8	7.0	93.48	7.90
162	8-13-65	Red Sandy Clay	38.5	18.5	20.0	16.4	------	------
163	9-14-65	Tan Clay	44.3	23.8	20.5	9.4	------	------
164	9-14-65	Tan Clay	29.8	21.2	8.6	7.0	------	------
200	1-19-66	Tan Sandy Clay with Gravel	31.5	16.6	14.9	11.7	34.40	1.345

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
209	1-19-66	Sandy Clay with Gravel	27.6	15.9	11.7	20.0	15.50	1.320
215	1-18-66	Yellow Sandy Clay	24.2	17.1	7.1	11.7	66.50	1.840
222	2-17-66	Yellow Sandy Clay	23.9	17.6	6.3	4.9	56.50	5.630
224	2-25-66	Gray Sandy Silt	25.7	18.8	6.9	5.9	106.00	6.970
226	2-25-66	Gray Sandy Silt	21.7	16.6	5.1	8.2	125.00	18.500
249	1-28-66	Tan Sandy Clay	23.9	22.1	1.8	11.7	37.80	3.080
250	1-29-66	Red Clay	32.1	21.0	11.1	9.4	41.32	4.010
252	3-18-66	Tan Sandy Clay	23.0	19.8	3.2	4.7	63.50	0.520
259	1-17-66	Tan Sandy Clay	25.6	22.3	3.3	7.0	58.64	0.428
291	3-5-66	Red Sandy Clay	17.4	15.2	2.2	9.4	60.03	2.730
292	3-5-66	Red Sandy Clay	19.1	15.5	3.6	3.5	52.63	1.968
293	3-5-66	Red Sandy Clay	19.5	16.3	3.2	3.5	50.18	0.099
295	3-5-66	Red Sandy Clay	18.3	15.5	2.8	5.9	53.55	0.968
296	3-5-66	Brown Sandy Clay	19.4	14.4	5.0	5.8	54.60	0.878

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
297	3-14-66	Brown Sandy Clay	19.6	14.6	5.0	5.9	48.30	0.886
298	3-14-66	Sandy Clay with Gravel	19.4	15.1	4.3	7.0	96.50	1.220
299	3-14-66	Brown Sandy Clay	21.4	15.4	6.0	14.0	88.33	1.069
300	3-14-66	Brown Sandy Clay	20.5	15.4	5.1	4.7	47.00	0.101
314	5-23-66	Gray Crushed Fines	21.6	18.4	3.2	2.4	20.80	3.090
315	5-23-66	Crushed Rock Fines	21.0	18.2	2.8	4.5	30.23	2.86
316	5-23-66	Crushed Rock Fines	21.4	17.1	4.3	3.5	16.40	3.260
317	5-23-66	Crushed Rock Fines	21.2	17.4	3.8	3.2	19.44	3.010
318	5-23-66	Crushed Rock Fines	22.6	17.8	4.8	3.6	18.00	2.880
319	5-28-66	Crushed Rock Fines	20.3	17.6	2.7	3.8	17.04	3.560

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
355	10-3-66	Tan Clay	28.1	13.7	14.4	14.0	20.16	0.446
358	10-18-66	Brown Gravel	30.8	12.8	18.0	13.6	5.99	1.499
364	10-18-66	Tan Clay	30.2	13.5	16.7	12.4	6.00	1.499
365	10-24-66	Tan Clay	33.7	14.0	19.7	17.1	6.00	1.499
400	12-15-67	Sandy Silt with Gravel	25.2	20.0	5.2	5.6	5.99	1.499
403	12-13-67	Black Organic Clay	83.2	34.2	49.0	20.2	6.00	1.499
414	12-14-67	Yellow Clay	29.1	19.9	9.2	25.8	5.99	1.499
422	12-15-67	Tan Silt	22.7	22.5	0.2	11.7	6.00	1.499
423	12-13-67	Organic Clay	42.3	21.1	21.2	6.6	5.99	1.499
433	12-15-67	Black Clay	51.4	24.2	27.2	7.5	5.99	1.499
434	12-15-67	Tan Clay	21.4	19.1	2.3	9.4	6.00	1.499
435	12-15-67	Black Clay	22.3	17.0	5.3	6.1	6.00	1.499
501	12-22-67	Sandy Clay with Gravel	18.8	17.9	0.9	12.9	42.35	0.500

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	Pl	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
502	12-22-67	Tan Clay	29.9	20.3	9.6	8.9	5.99	1.499
506	12-22-67	Black Clay	65.0	26.8	38.2	2.4	29.82	0.302
509	12-21-67	Black Silty Clay	26.1	20.5	5.6	9.4	5.99	1.499
513	12-22-67	Black Clay	32.0	23.0	9.0	6.3	5.99	1.499
515	12-21-67	Tan Clay	41.2	22.3	18.9	13.6	5.99	1.499
520	12-21-67	Yellow Clay	24.8	16.7	8.1	16.4	6.06	1.484
525	12-21-67	Tan Clay	26.1	21.9	4.2	30.6	6.01	1.487
526	12-21-67	Gravel and Red Silt	17.7	17.1	0.6	2.8	5.99	1.499
531	12-21-67	Black Clay with Gravel	44.5	21.7	22.8	14.8	6.00	1.499
538	12-22-67	Tan Clay with Gravel	23.8	16.8	7.0	27.0	5.99	1.499
540	12-22-67	Yellow Silt	17.7	17.2	0.5	5.6	6.00	1.499
545	12-21-67	Yellow Silt	20.0	16.6	3.4	8.9	5.99	1.499

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
547	12-21-67	Brown Silt	24.2	21.4	2.8	4.7	5.99	1.499
549	12-22-67	Brown Silt	25.7	23.7	2.0	10.8	6.00	1.499
551	12-22-67	Sandy Clay	33.1	21.3	11.8	12.9	6.00	1.499
558	12-21-67	Clayey Silt	15.6	14.6	1.0	7.3	5.99	1.499
561	12-21-67	Yellow Silt	20.1	19.9	0.3	9.4	6.00	1.499
562	12-21-67	Silty Sand with Gravel	19.6	19.0	0.6	10.2	6.00	1.499
566	12-21-67	Black Clay	43.3	20.7	22.6	3.6	5.99	1.499
568	12-21-67	Black Clay	38.8	17.6	21.2	12.7	5.99	1.499
2	1-22-65	Sand	----	----	N.P.	----	4.36	1.300
4	1-29-65	Tan Sand	----	----	N.P.	----	5.26	1.400
6	2-16-65	Red Sand	----	----	N.P.	----	8.83	1.018
40	3-10-65	Sandy Silt	----	----	N.P.	----	10.67	0.843

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
41	3-10-65	Sand	----	----	N.P.	----	11.90	0.756
42	3-11-65	Red Sandy Gravel	----	----	N.P.	----	110.09	0.309
43	3-11-65	Brown Sand	----	----	N.P.	----	115.48	0.289
46	3-11-65	Brown Sand	----	----	N.P.	----	6.00	1.499
47	3-11-65	Brown Sandy Gravel	----	----	N.P.	----	60.09	8.525
48	3-12-65	Red Sand	----	----	N.P.	----	7.12	1.265
52	3-15-65	Tan Sand	----	----	N.P.	----	7.96	1.351
58	3-17-65	Brown Sand	----	----	N.P.	----	4.78	1.381
59	2-18-65	Brown Sand	----	----	N.P.	----	8.64	0.450
60	3-30-65	Red Sand	----	----	N.P.	----	5.91	1.491
63	3-22-6 5	Sandy Silt	----	----	N.P.	----	6.00	1.499
71	3-25-65	Red Sand	----	----	N.P.	----	6.79	1.517
74	3-26-65	Tan Sand	----	----	N.P.	----	10.30	0.873

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
77	4-1-65	Red Silt	----	----	N.P.	----	5.99	1.499
78	4-1-65	Clay-Sand	----	----	N.P.	----	8.22	1.289
81	4-2-65	Brown Silty Sand	----	----	N.P.	----	5.99	1.499
86	4-1-65	Tan Sand	----	----	N.P.	----	9.06	0.993
87	3-31-65	Tan Sand	----	----	N.P.	----	5.88	1.494
88	3-31-65	White Silt	----	----	N.P.	----	8.87	1.084
90	4-9-65	Tan Sand	----	----	N.P.	----	9.98	0.901
91	5-18-65	Brown Silty Sand	----	----	N.P.	----	2.88	0.820
92	5-18-65	Tan Sand	----	----	N.P.	----	6.74	1.535
95	5-7-65	Tan Sand	----	----	N.P.	----	5.48	2.010
96	6-11-65	Tan Sand	----	----	N.P.	----	39.60	0.717
97	5-18-65	Brown Silty Sand	----	----	N.P.	----	38.01	0.735
98	6-15-65	Tan Sand	----	----	N.P.	----	41.89	0.580
101	5-12-65	Brown Sand	----	----	N.P.	----	10.09	0.891

Summary of Data

HRP-20 Sample	Date Sample	Visual Sescription	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
102	5-19-65	Brown Silty Sand	----	----	N.P.	----	10.13	0.888
107	5-21-65	Tan Sand	----	----	N.P.	----	2.56	0.840
111	5-12-65	Tan Sand	----	----	N.P.	----	9.80	0.917
113	5-21-65	Tan Sand	----	----	N.P.	----	2.46	0.810
114	5-12-65	Red Sand	----	----	N.P.	----	8.20	1.295
115	5-12-65	Red Sand	----	----	N.P.	----	9.34	0.470
116	5-7-65	Tan Sand	----	----	N.P.	----	11.82	1.610
117	5-18-65	White Sand	----	----	N.P.	----	6.84	0.650
118	5-18-65	Red Sand	----	----	N.P.	----	5.45	1.472
120	5-18-65	Red Sand	----	----	N.P.	----	6.79	0.670
121	6-25-65	Red Sand	----	----	N.P.	----	6.03	1.503
122	5-21-65	Tan Sand	----	----	N.P.	----	3.49	0.810
123	8-31-65	Red Clayey Sand	----	----	N.P.	----	10.25	1.585
124	5-18-65	Red Sand	----	----	N.P.	----	30.67	1.310

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
126	5-12-65	Red Sand	----	----	N.P.	----	32.50	0.250
132	6-2-65	Tan Sand	----	----	N.P.	----	2.47	0.770
142	5-19-65	Brown Sand	----	----	N.P.	----	6.03	0.700
152	8-13-65	Tan Sand	----	----	N.P.	----	4.29	1.300
156	7-8-65	Tan Clayey Sand	----	----	N.P.	----	78.33	6.950
157	8-13-65	Brown Sandy Gravel	----	----	N.P.	----	52.78	5.260
158	8-13-65	Tan Sandy Gravel	----	----	N.P.	----	65.38	1.530
159	8-13-65	Brown Sand	----	----	N.P.	----	7.64	1.653
160	8-13-65	Brown Sand	----	----	N.P.	----	5.50	0.680
161	8-13-65	Brown Sand	----	----	N.P.	----	9.15	1.634
165	8-17-65	Brown Sand	----	----	N.P.	----	10.25	0.440
167	8-17-65	Tan Sand	----	----	N.P.	----	4.94	0.720
168	8-17-65	Tan Sand	----	----	N.P.	----	3.97	0.930
170	8-17-65	Red Sand	----	----	N.P.	----	31.01	0.638

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
171	8-17-65	Red Sand	----	----	N.P.	----	18.06	0.757
172	8-17-65	Tan Sand	----	----	N.P.	----	13.41	0.916
173	8-17-65	Tan Sand	----	----	N.P.	----	20.03	1.511
174	11-23-65	Donnafill	----	----	N.P.	----	11.16	0.806
175	11-23-65	Donnafill	----	----	N.P.	----	11.25	0.799
176	11-23-65	Donnafill	----	----	N.P.	----	8.83	1.435
201	1-28-65	Tan Sandy Clay	----	----	N.P.	----	18.70	0.340
202	1-28-65	Tan Sandy Clay	----	----	N.P.	----	8.28	0.756
203	1-28-65	Sandy Clay with Gravel	----	----	N.P.	----	17.10	0.735
204	1-28-65	Tan Sandy Gravel	----	----	N.P.	----	11.10	0.669
205	1-28-65	Tan Sandy Gravel	----	----	N.P.	----	9.60	0.900
206	1-28-65	Tan Sandy Gravel	----	----	N.P.	----	8.10	0.618
207	1-28-65	Tan Sandy Gravel	----	----	N.P.	----	11.70	0.765

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
208	1-28-65	Tan Sandy Gravel	----	----	N.P.	----	11.50	1.370
210	1-18-65	Yellow Clayey Sand	----	----	N.P.	----	49.62	3.010
211	12-6-65	Gray Sand	----	----	N.P.	----	43.30	2.900
212	1-18-66	Yellow Clayey Sand	----	----	N.P.	----	65.00	6.800
213	1-18-66	Yellow Clayey Sand	----	----	N.P.	----	25.80	3.000
214	1-18-66	Yellow Clayey Sand	----	----	N.P.	----	5.30	2.220
216	1-19-66	Yellow Clayey Sand	----	----	N.P.	----	17.20	2.740
217	2-10-66	Gray Sandy Silt	----	----	N.P.	----	51.80	1.930
218	2-25-66	Gray Sandy Silt	----	----	N.P.	----	16.40	1.530
219	2-25-66	Gray Sandy Silt	----	----	N.P.	----	59.40	4.160
220	2-9-66	Gray Sandy Silt	----	----	N.P.	----	50.50	4.900
221	2-10-66	Gray Sandy Silt	----	----	N.P.	----	18.10	3.04

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
223	2-11-66	Gray Sandy Silt	----	----	N.P.	----	31.60	4.250
225	2-9-66	Gray Sandy Silt	----	----	N.P.	----	42.60	3.010
227	2-10-66	Gray Sandy Silt	----	----	N.P.	----	61.50	5.610
228	2-11-66	Gray Sandy Silt	----	----	N.P.	----	26.00	3.120
229	2-25-66	Gray Sandy Silt	----	----	N.P.	----	14.10	2.460
230	2-11-66	Brown Clayey Sand	----	----	N.P.	----	48.66	1.051
231	2-14-66	Gray Sandy Silt	----	----	N.P.	----	19.40	1.680
232	3-27-66	Gray Silt	----	----	N.P.	----	27.00	1.780
233	3-26-66	Tan Sandy Silt	----	----	N.P.	----	62.00	1.140
234	2-9-66	Sandy Silt with Gravel	----	----	N.P.	----	43.40	4.100
235	2-21-66	Gray Sandy Silt	----	----	N.P.	----	31.20	1.430
236	3-27-66	Tan Sand	----	----	N.P.	----	86.50	0.513
237	2-14-66	Gray Sandy Silt	----	----	N.P.	----	21.30	2.240

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
238	2-2-66	Gray Sandy Silt	----	----	N.P.	-----	17.30	2.230
239	2-10-66	Gray Sandy Silt	----	----	N.P.	-----	18.45	7.440
240	2-25-66	Gray Sandy Silt	----	----	N.P.	-----	13.18	2.730
241	2-14-66	Gray Sandy Silt	----	----	N.P.	-----	16.11	5.740
242	2-10-66	Gray Sandy Silt	----	----	N.P.	-----	12.40	1.500
243	3-27-66	Gray Silt	----	----	N.P.	-----	64.60	8.790
244	1-28-66	Crushed Limestone	----	----	N.P.	-----	11.25	4.200
245	2-14-66	Gray Sandy Silt	----	----	N.P.	-----	5.84	1.310
246	1-28-66	Crushed Limestone	----	----	N.P.	-----	17.30	2.230
247	1-28-66	Crushed Limestone	----	----	N.P.	-----	63.30	6.980
248	1-28-66	Crushed Limestone	----	----	N.P.	-----	43.00	4.920
251	1-29-66	Tan Clayey Sand	----	----	N.P.	-----	18.30	1.785
253	2-16-66	Gray Silty Sand	----	----	N.P.	-----	40.70	5.040

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
254	3-18-66	Gray Silt	----	----	N.P.	----	34.30	0.762
255	2-16-66	Gray Sandy Silt	----	----	N.P.	----	40.70	5.040
256	3-18-66	Gray Silty Sand	----	----	N.P.	----	19.25	1.300
257	3-30-66	Gray Crushed Rock	----	----	N.P.	----	31.10	4.873
258	3-30-66	Gray Crushed Rock	----	----	N.P.	----	12.01	4.440
260	4-11-66	Crushed Rock	----	----	N.P.	----	24.00	5.400
261	1-7-66	Tan Silty Sand	----	----	N.P.	----	25.65	4.980
262	1-7-66	Tan Silty Sand	----	----	N.P.	----	65.90	0.520
263	1-7-66	Tan Silty Sand	----	----	N.P.	----	18.55	0.321
264	12-6-65	Tan Silty Sand	----	----	N.P.	----	61.20	0.800
265	12-6-65	Silty Sand with Gravel	----	----	N.P.	----	110.00	3.270
266	12-2-65	Tan Silty Sand	----	----	N.P.	----	31.15	4.110
267	12-1-65	Tan Silty Sand	----	----	N.P.	----	37.10	3.990
268	12-1-65	Tan Silty Sand	----	----	N.P.	----	69.20	1.008

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
269	12-1-65	Tan Silty Sand	----	----	N.P.	----	91.60	3.201
270	11-29-65	Silty Sand with Gravel	----	----	N.P.	----	69.90	1.570
271	3-31-66	Tan Silt	----	----	N.P.	----	4.96	1.730
272	3-30-66	Tan Silt	----	----	N.P.	----	36.80	6.760
273	4-11-66	Tan Crushed Rock	----	----	N.P.	----	20.19	4.560
274	4-12-66	Tan Crushed Rock	----	----	N.P.	----	19.81	5.220
275	4-12-66	Tan Crushed Rock	----	----	N.P.	----	3.91	5.010
276	4-12-66	Silty Sand with Gravel	-----	----	N.P.	----	84.60	3.680
277	4-12-66	Brown Silty Sand	----	----	N.P.	----	72.60	4.225
278	4-12-66	Brown Silty Sand	----	----	N.P.	----	77.00	0.398
279	4-12-66	Brown Silty Sand	----	----	N.P.	----	69.00	4.075
280	4-14-66	Tan Silt with Gravel	----	----	N.P.	----	135.40	12.000

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Palstic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
281	4-12-66	Gray Crushed Stone	----	----	N.P.	----	20.11	2.910
282	4-12-66	Gray Crushed Stone	----	----	N.P.	----	65.42	5.110
283	4-12-66	Gray Crushed Stone	----	----	N.P.	----	35.80	4.075
284	4-12-66	Gray Crushed Stone	----	----	N.P.	----	20.00	2.370
285	4-12-66	Gray Crushed Stone	----	----	N.P.	----	22.60	3.450
286	4-12-66	Gray Crushed Stone	----	----	N.P.	----	15.10	2.800
287	4-12-66	Gray Crushed Stone	----	----	N.P.	----	7.36	2.142
288	4-12-66	Gray Crushed Stone	----	----	N.P.	----	29.80	0.616
289	4-12-66	Gray Crushed Stone	----	----	N.P.	----	20.50	4.210

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
290	4-12-66	Gray Crushed Stone	----	----	N.P.	----	58.40	2.680
294	3-5-66	Brown Sandy Gravel	----	----	N.P.	----	60.00	0.745
301	4-30-66	Gray Silt	----	----	N.P.	----	16.00	4.550
302	4-30-66	Gray Silt	----	----	N.P.	----	15.59	5.065
303	4-30-66	Gray Silt	----	----	N.P.	----	20.38	8.340
304	4-30-66	Gray Silt	----	----	N.P.	----	34.30	8.580
305	4-30-66	Gray Silt	----	----	N.P.	----	32.90	8.360
306	4-30-66	Gray Silt	----	----	N.P.	----	30.99	2.940
307	4-30-66	Gray Silt	----	----	N.P.	----	16.60	2.810
308	4-30-66	Gray Silt	----	----	N.P.	----	18.60	3.960
309	4-30-66	Gray Silt	----	----	N.P.	----	23.60	4.790
310	4-30-66	Gray Silt	----	----	N.P.	----	43.30	4.100
311	4-30-66	Gray Silt	----	----	N.P.	----	30.00	1.480

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
312	5-14-66	Gray Silt	----	----	N.P.	----	15.55	3.000
313	5-23-66	Crushed Rock Fines	----	----	N.P.	----	43.40	4.110
320	5-23-66	Crushed Rock Fines	----	----	N.P.	----	47.10	5.440
321	5-23-66	Tan Sandy Silt	----	----	N.P.	----	71.05	9.110
322	5-23-66	Tan Sandy Silt	----	----	N.P.	----	62.40	8.080
323	5-23-66	Tan Sandy Silt	----	----	N.P.	----	60.31	8.000
324	6-1-66	Tan Sandy Silt	----	----	N.P.	----	112.00	10.310
325	6-1-66	Tan Sandy Silt	----	----	N.P.	----	84.32	9.411
326	6-1-66	Tan Sandy Silt	----	----	N.P.	----	30.00	7.020
327	6-1-66	Tan Sandy Silt	----	----	N.P.	----	52.61	7.980
328	6-1-66	Tan Sandy Silt	----	----	N.P.	----	34.10	2.325
329	6-1-66	Tan Sandy Silt	----	----	N.P.	----	38.22	3.000
330	6-1-66	Tan Sandy Silt	----	----	N.P.	----	112.20	5.820
331	6-1-66	Tan Sandy Silt	----	----	N.P.	----	96.40	9.733

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
332	6-2-66	White Rock Fines	----	----	N.P.	----	12.73	2.318
333	6-2-66	White Rock Fines	----	----	N.P.	----	8.34	1.766
334	6-2-66	White Rock Fines	----	----	N.P.	----	4.90	1.361
335	6-2-66	White Rock Fines	----	----	N.P.	----	15.90	2.748
336	6-2-66	White Rock Fines	----	----	N.P.	----	18.15	5.490
337	6-2-66	White Rock Fines	----	----	N.P.	----	23.00	6.220
338	6-2-66	White Rock Fines	----	----	N.P.	----	44.70	4.030
339	6-2-66	Brown Sand with Gravel	----	----	N.P.	----	56.67	0.780
340	6-2-66	Brown Sand	----	----	N.P.	----	38.46	0.980
341	6-2-66	Brown Sand	----	----	N.P.	----	27.83	0.820
342	6-2-66	Brown Sand	----	----	N.P.	----	29.05	1.030
343	6-2-66	Brown Sand	----	----	N.P.	----	31.55	1.275
345	6-2-66	Brown Sand	----	----	N.P.	----	49.60	0.780

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
346	6-25-66	Brown Sand	----	----	N.P.	----	31.00	2.330
347	6-25-66	Brown Sand	----	----	N.P.	----	16.90	1.190
348	6-25-66	Brown Sand	----	----	N.P.	----	19.38	1.460
349	6-25-66	Brown Sand	----	----	N.P.	----	9.68	1.560
350	6-25-66	Brown Sand	----	----	N.P.	----	5.87	1.470
353	10-6-66	Sand with Gravel	----	----	N.P.	----	45.41	3.400
354	10-10-66	Sand with Gravel	----	----	N.P.	----	35.14	4.790
356	10-5-66	Brown Gravel	----	----	N.P.	----	65.62	4.670
357	10-6-66	Brown Gravel	----	----	N.P.	----	49.23	6.780
359	10-11-66	Brown Gravel	----	----	N.P.	----	70.00	0.990
360	10-11-66	Brown Gravel	----	----	N.P.	----	44.44	1.780
361	10-11-66	Brown Gravel	----	----	N.P.	----	38.46	1.790
362	10-13-66	Brown Gravel	----	----	N.P.	----	37.78	3.600
363	10-13-66	Brown Gravel	----	----	N.P.	----	52.31	2.550

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
401	12-14-67	Sand and Gravel	----	----	N.P.	----	45.33	1.080
402	12-14-67	Sand	----	----	N.P.	----	42.05	0.490
404	12-14-67	Red Clayey Sand with Gravel	----	----	N.P.	----	33.13	1.300
405	12-14-67	Gray Silty Sand	----	----	N.P.	----	11.07	1.151
406	12-14-67	Sand and Gravel	----	----	N.P.	----	84.62	1.570
407	12-14-67	Silt	----	----	N.P.	----	50.73	1.110
408	12-14-67	Sand	----	----	N.P.	----	1.84	1.450
409	12-14-67	Red Sand	----	----	N.P.	----	30.77	1.110
410	12-14-67	Sand	----	----	N.P.	----	5.99	1.499
411	12-14-67	Sand and Gravel	----	----	N.P.	----	137.46	0.808
412	12-14-67	Loess	----	----	N.P.	----	122.61	1.210
413	12-14-67	Silty Sand with Gravel	----	----	N.P.	----	61.63	2.420
415	12-13-67	Stone Fines	----	----	N.P.	----	107.50	9.080
416	12-14-67	Silty Sand	----	----	N.P.	----	9.74	0.923

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
417	12-14-67	Silty Sand	----	----	N.P.	----	8.12	1.372
418	12-14-67	Gravel and Sand	----	----	N.P.	----	59.38	1.290
419	12-14-67	Stone Fines	----	----	N.P.	----	118.42	4.113
420	12-14-67	Stone Fines	----	----	N.P.	----	141.33	10.975
421	12-14-67	Brown Sandy Gravel	----	----	N.P.	----	55.59	0.338
424	12-14-67	Gravel and Red Sand	----	----	N.P.	----	74.56	2.320
425	12-14-67	Sand	----	----	N.P.	----	2.63	0.830
427	12-14-67	Gravel and Sand	----	----	N.P.	----	70.97	2.230
430	12-15-67	Black Silty Sand	----	----	N.P.	----	10.76	0.836
431	12-14-67	Gravel and Sand	----	----	N.P.	----	24.50	0.920
432	12-15-67	Sand	----	----	N.P.	----	5.99	1.499
503	12-18-67	Sand	----	----	N.P.	----	36.05	0.900
504	12-20-67	Silty Sand	----	----	N.P.	----	6.00	1.499
505	12-18-67	Sand	----	----	N.P.	----	9.74	1.187
507	12-18-67	Gravel and Sand	----	----	N.P.	----	33.33	1.110

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
508	12-18-67	Sand	----	----	N.P.	----	4.83	1.343
510	12-22-67	Black Silty Sand	----	----	N.P.	----	42.59	8.710
511	12-18-67	Gravel and Sand	----	----	N.P.	----	34.58	1.170
512	12-18-67	Clayey Sand	----	----	N.P.	----	2.63	0.830
514	12-18-67	Gravel and Sand	----	----	N.P.	----	40.00	0.490
516	12-18-67	Gravel and Sand	----	----	N.P.	----	59.13	1.840
517	12-20-67	Sandy Silt	----	----	N.P.	----	5.99	1.499
518	12-18-67	Gravel and Sand	----	----	N.P.	----	81.25	8.890
519	12-18-67	Clayey Sand	----	----	N.P.	----	3.13	0.780
521	12-21-67	Black Sandy Silt	----	----	N.P.	----	162.93	6.729
522	12-18-67	Gravel with Sand	----	----	N.P.	----	43.60	1.120
523	12-18-67	Sand	----	----	N.P.	----	3.52	0.770
524	12-18-67	Gravel with Fine Sand	----	----	N.P.	----	6.00	1.499
527	12-21-67	Red Clayey Sand	----	----	N.P.	----	6.00	1.499

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
528	12-22-67	Gravel with Fine Sand	----	----	N.P.	----	120.61	0.825
529	12-20-67	Fine Sand	----	----	N.P.	----	12.43	0.858
530	12-20-67	Gravel with Fine Sand	----	----	N.P.	----	175.29	3.685
532	12-18-67	Fine Sand	----	----	N.P.	----	57.50	0.600
533	12-18-67	Fine Sand	----	----	N.P.	----	5.75	1.478
534	12-22-67	Fine Red Sand	----	----	N.P.	----	5.54	1.469
535	12-18-67	Clayey Sand	----	----	N.P.	----	105.48	0.350
536	12-18-67	Sand	----	----	N.P.	----	27.68	7.370
537	12-18-67	Silty Sand	----	----	N.P.	----	6.14	1.505
539	12-18-67	Gravel with Silty Sand	----	----	N.P.	----	75.56	1.050
541	12-18-67	Sand	----	----	N.P.	----	43.00	0.980
542	12-20-67	Crushed Limestone	----	----	N.P.	----	42.86	4.760
543	12-18-67	Gravel and Sand	----	----	N.P.	----	43.64	0.825
544	12-18-67	Fine Sand	----	----	N.P.	----	5.68	1.458
546	12-20-67	Fine Sand	----	----	N.P.	----	175.57	7.234
548	12-18-67	Gravel and Sand	----	----	N.P.	----	55.20	4.870
550	12-18-67	Gravel and Fine Sand	----	----	N.P.	----	131.99	0.712

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits				Coefficient of Uniformity	Coefficient of Gradation
			LL	PL	PI	Flow Index	C_u	C_g
552	12-18-67	Gravel and Fine Sand	----	----	N.P.	----	191.01	0.709
553	12-20-67	Gray Silt	----	----	N.P.	----	5.99	1.499
554	12-18-67	Gravel with Fine Sand	----	----	N.P.	----	108.54	1.936
555	12-20-67	Gray Silt	----	----	N.P.	----	6.00	1.499
556	12-18-67	Silty Sand	----	----	N.P.	----	190.88	2.119
557	12-18-67	Gravel with Sand	----	----	N.P.	----	109.18	1.553
559	12-18-67	Clayey Sand	----	----	N.P.	----	6.00	1.499
560	12-18-67	Silty Sand with Gravel	----	----	N.P.	----	131.08	0.448
563	12-18-67	Clayey Sand	----	----	N.P.	----	7.95	1.356
564	12-21-67	Fine Sand	----	----	N.P.	----	223.18	15.703
565	12-18-67	Gravel and Sand	----	----	N.P.	----	124.53	1.098
567	12-18-67	Gravel and Sand	----	----	N.P.	----	50.00	1.800

Summary of Data

HRP-20 Sample No.	Date Sample Tested	Visual Description of Sample	Plastic and Liquid Limits LL	PL	PI	Flow Index	Coefficient of Uniformity C_u	Coefficient of Gradation C_g
569	12-18-67	Sand	----	----	N.P.	----	85.00	7.350
570	12-18-67	Sand	----	----	N.P.	----	73.65	0.396
571	12-18-67	Silty Sand	----	----	N.P.	----	10.43	0.862

Appendix - C

SUBGRADE AND BASE CHARACTERISTICS - GRADATION

Listed in Appendis - C are gradations for all soil samples taken in Phase I, II, and III of Highway Research Project No. 20. All soil samples are listed in numerical order according to sample number. For each soil sample, the soil sample number, the date the sample was tested, a visual description of the soil sample, and the percent passing the 2, 1-1/2, 1, 3/4, 3/8, No. 4, No. 10, No. 40, and No. 200 sieve are shown. Table C-1 is an example of the presentation of gradations for each sample:

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
002	1-22-65	Sand	100.0	100.0	100.0	100.0	100.0	99.9	99.1	95.4	11.8

Table C-1

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
002	1-22-65	Sand	100.0	100.0	100.0	100.0	100.0	99.9	99.1	95.4	11.8
003	1-29-65	Clayey Silt	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.0
004	1-24-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	99.9	99.9	98.2	14.9
005	1-25-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.9	97.2	82.2
006	1-27-65	Red Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	53.7
007	1-26-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.4	86.2
008	1-26-65	Tan Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.8	98.3	85.7
009	1-27-65	Slightly Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	84.6
010	1-27-65	Brownish Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.6	96.8
011	1-27-65	Tan Clay with Trace of Silt	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.8
012	1-29-65	Red Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.1
013	1-28-65	Brown Clay-Silt	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.7	94.6
014	1-28-65	Grayish Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.6
015	1-30-65	Red Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.6	92.2	34.1

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	Mechanical Analysis % Passing No.4	No.10	No.40	No.200
016	2-1-65	Tannish Brown Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.0	97.1	81.6
017	1-29-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	98.9	95.9	94.6	92.5	71.3
018	1-28-65	Brown Sandy Clay	100.0	100.0	99.8	99.1	92.9	83.9	80.7	76.6	70.6
019	1-28-65	Tan Silty Clay	100.0	100.0	99.4	96.3	77.0	57.6	48.2	32.9	29.4
020	1-28-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	99.3	95.1	93.9	84.0	76.9
021	1-28-65	Tan Sandy Clay	100.0	99.1	97.1	93.3	84.9	76.3	74.3	71.1	50.0
022	1-29-65	Brown Silty Clay	100.0	100.0	100.0	100.0	100.0	99.8	99.8	99.3	98.4
023	1-28-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	100.0	100.0	100.0	97.9	96.7
024	1-29-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	96.7
025	1-29-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	98.4
026	2-1-65	Tan Sandy Clay	100.0	100.0	100.0	98.7	92.8	88.7	87.1	80.5	59.7
027	2-1-65	Yellowish Tan Sandy Clay	98.8	98.8	98.8	98.4	93.3	90.2	87.9	83.4	66.8
028	2-1-65	Red Clay	100.0	100.0	97.9	95.3	85.7	77.2	76.5	61.5	55.0

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	Mechanical Analysis % Passing No.4	No.10	No.40	No.200
029	2-2-65	Red Sandy Clay	100.0	100.0	100.0	99.7	99.4	98.8	98.6	97.7	85.9
030	2-2-65	Brown Silty Clay	100.0	100.0	100.0	100.0	100.0	99.9	99.6	98.8	97.1
031	1-29-65	Tan Silty Clay	100.0	100.0	100.0	100.0	99.3	98.1	97.3	92.4	88.5
032	2-3-65	Brown Sandy Clay	100.0	100.0	100.0	100.0	88.8	79.6	64.9	56.6	42.4
033	2-3-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	92.1	81.0	76.7	56.7	47.5
034	2-3-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	98.5	96.3	93.5	79.6	66.8
035	2-3-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	97.8	93.2	92.9	79.3	63.5
036	1-30-65	Reddish Brown Clay	100.0	100.0	100.0	100.0	92.5	78.9	77.9	67.8	60.6
037	2-3-65	Brown Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.6	98.1	62.7
038	2-3-65	Brown Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	58.3	41.3
039	2-5-65	Tan Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	60.2	36.5
040	2-9-65	Sandy Silt	100.0	100.0	100.0	100.0	98.8	97.9	97.1	95.6	39.1
041	2-9-65	Sand	100.0	100.0	100.0	100.0	99.1	96.6	93.1	87.9	43.7
042	2-10-65	Red Sandy Gravel	100.0	100.0	100.0	100.0	80.1	56.7	44.8	39.3	15.0
043	2-5-65	Brown Sand	100.0	100.0	100.0	100.0	84.9	66.5	50.3	44.4	23.4

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing					Mechanical Analysis % Passing			
			2	1-1/2	1	3/4	3/8	No.4	No.10	No.40	No.200
044	2-4-65	Red Sandy Clay	100.0	100.0	100.0	100.0	93.3	86.9	79.5	77.3	45.9
045	2-8-65	Tan Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.7	76.1
046	2-8-65	Brown Sand	100.0	100.0	100.0	100.0	95.5	91.5	87.1	85.6	30.1
047	2-9-65	Brown Sandy Gravel	100.0	100.0	100.0	100.0	71.0	39.6	24.9	19.7	8.1
048	2-8-65	Red Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.6	99.1	31.5
049	2-11-65	Red Sandy Clay	100.0	100.0	100.0	100.0	90.8	81.8	72.9	71.0	38.2
050	2-11-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	76.4	58.2	40.1	36.3	17.7
051	2-8-65	Red Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.2	98.7	77.5
052	2-16-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	24.9
053	2-15-65	Brown Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.2	87.6
054	2-11-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	78.6
055	2-16-65	Red Sand with Clay	100.0	100.0	100.0	100.0	98.3	96.2	94.9	93.3	59.9
056	2-22-65	Red Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.1	98.5	68.8
057	2-16-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.6	97.4	92.3

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	Mechanical Analysis % Passing No.4	No.10	No.40	No.200
058	2-18-65	Brown Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	13.6
059	2-18-65	Brown Sand	100.0	100.0	100.0	100.0	90.6	82.0	64.9	57.7	7.7
060	2-18-65	Red Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.3	17.2
061	2-23-65	Red Sandy Clay	100.0	100.0	100.0	100.0	95.7	93.0	83.0	74.5	45.0
062	2-22-65	Tan Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.4	91.2
063	2-22-65	Sandy Silt	100.0	100.0	100.0	100.0	100.0	100.0	99.3	97.4	73.1
064	3-1-65	Tan Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	98.7	97.3	76.2
065	2-23-65	Tan Clayey Sand	100.0	100.0	100.0	100.0	100.0	99.4	98.8	97.2	69.8
066	2-22-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.7	94.9
067	2-23-65	Tan Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	98.7	95.8	64.9
068	3-1-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	97.9	97.6	97.5
069	3-4-65	Brownish Gray Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	99.3
070	3-2-65	Tan Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.1	98.1	48.2
071	3-1-65	Red Sand	100.0	100.0	100.0	100.0	100.0	100.0	98.9	94.4	19.2

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	Mechanical Analysis % Passing No.4	No.10	No.40	No.200
072	3-2-65	Red Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.4	61.7
073	3-2-65	Brownish Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.1	98.1
074	1-30-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.5	44.8
075	3-4-65	Brown Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.8	98.8	94.1
076	3-8-65	Brown Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	98.3
077	3-8-65	Red Silt	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.9	78.4
078	1-30-65	Clay-Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	26.1
079	3-8-65	Red Clayey Silt	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.4	86.6
080	3-9-65	Reddish Brown Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	98.9
081	3-8-65	Brown Silty Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.8	68.2
082	3-15-65	Brown Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.7	74.0
083	3-15-65	Tan Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.7	97.9	80.6
084	3-8-65	Red Sandy Clay	100.0	100.0	100.0	100.0	98.9	97.3	95.9	93.0	57.1
085	3-11-65	Red Sandy Clay	100.0	100.0	100.0	100.0	95.8	92.1	88.8	81.5	40.7
086	1-29-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.4	29.9

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	Mechanical Analysis % Passing No.4	No.10	No.40	No.200
087	3-11-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.3	17.1
088	3-9-65	White Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.1	28.9
089	3-15-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	99.5	99.5	98.8	98.2	66.9
090	3-11-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.5	99.2	35.9
091	5-11-65	Brown Silty Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.2	90.2	13.7
092	5-11-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	97.9	87.7	17.6
093	6-16-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	97.4	96.2	92.7	89.8	64.9
094	6-16-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	97.4	96.2	92.7	89.8	64.9
095	5-4-65	Tan Sand	100.0	100.0	100.0	100.0	64.6	37.9	20.8	11.6	5.2
096	5-19-65	Tan Sand	100.0	100.0	100.0	100.0	84.5	73.9	55.9	34.6	11.2
097	5-11-65	Brown Silty Sand	100.0	100.0	100.0	100.0	79.7	64.1	46.9	28.2	8.1
098	5-19-65	Tan Sand	100.0	100.0	100.0	100.0	81.5	67.6	51.6	31.5	9.7
099	5-4-65	Red Sandy Clay	100.0	100.0	100.0	100.0	84.8	75.5	53.5	34.7	13.5
100	5-17-65	Red Sandy Clay	100.0	100.0	100.0	100.0	87.1	78.1	58.3	38.5	15.4

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	Mechanical Analysis % Passing No.4	No.10	No.40	No.200
101	5-3-65	Brown Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.8	96.1	34.2
102	5-12-65	Brown Silty Sand	100.0	100.0	100.0	100.0	100.0	99.4	98.8	93.8	32.9
103	5-21-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	98.9	96.6	72.7
104	5-21-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	97.4	94.9	74.6
105	5-3-65	Red Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	84.9	72.0	45.6
106	5-21-65	Brown Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.7	99.6	16.0
107	5-12-65	Tan Sand	100.0	100.0	100.0	100.0	99.4	99.4	97.9	96.9	4.8
108	5-19-65	Red Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	97.8	95.1	58.4
109	5-7-65	Red Clayey Silt	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.7	71.4
110	6-2-65	Red Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.3	80.3
111	5-3-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.6	99.2	34.5
112	5-20-65	Red Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	47.6
113	5-12-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	2.0
114	5-3-65	Red Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	25.9
115	5-12-65	Red Sand	100.0	100.0	100.0	100.0	88.8	81.2	69.9	54.8	9.0

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	Mechanical Analysis % Passing No.4	No.10	No.40	No.200
116	5-3-65	Tan Sand	100.0	100.0	100.0	100.0	92.6	82.3	72.8	25.7	5.4
117	5-7-65	White Sand	100.0	100.0	100.0	100.0	96.9	94.3	91.2	51.2	2.1
118	5-9-65	Red Sand	100.0	100.0	100.0	100.0	98.9	97.2	94.9	70.2	11.2
119	5-7-65	Red Silty Clay	100.0	100.0	100.0	100.0	99.4	98.8	97.6	75.8	31.9
120	5-10-65	Red Sand	100.0	100.0	100.0	100.0	100.0	99.3	97.1	58.9	9.3
121	6-2-65	Red Sand	100.0	100.0	100.0	100.0	99.5	98.8	97.9	85.2	15.4
122	5-12-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.3	71.8	3.6
123	5-17-65	Red Clayey Sand	100.0	100.0	100.0	100.0	99.4	98.6	97.6	66.4	20.4
124	5-10-65	Red Sand	100.0	100.0	100.0	100.0	82.7	60.4	42.8	17.5	4.6
125	5-17-65	Red Clayey Sand	100.0	100.0	100.0	100.0	81.8	57.6	40.1	22.9	1.7
126	5-4-65	Red Sand	100.0	100.0	100.0	100.0	84.1	68.4	56.7	40.9	8.5
127	6-3-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.8	97.2	94.1
128	6-3-65	Brown Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.6	98.0
129	6-3-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.1	98.1	94.4
130	6-4-65	Brown Clay	100.0	100.0	100.0	100.0	98.4	97.8	96.9	95.5	91.7

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing						Mechanical Analysis % Passing		
			2	1-1/2	1	3/4	3/8	No.4	No.10	No.40	No.200
131	5-21-65	Dark Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.4	98.8	96.8
132	5-10-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.8	4.5
133	6-23-65	Red Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.2
134	5-10-65	Gray Silt	100.0	100.0	100.0	100.0	100.0	100.0	99.8	98.9	97.4
135	5-21-65	Red Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.2	96.9
136	5-19-65	Light Brown Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.4	98.4
137	5-21-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.7	96.4
138	6-4-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	95.7	94.4
139	6-17-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.7	95.5
140	5-19-65	Dark Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	100.0	98.4	93.9
141	5-10-65	Tan Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	94.6	39.2
142	5-10-65	Brown Sand	100.0	100.0	100.0	100.0	98.5	94.2	89.8	57.5	8.9
152	6-22-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	12.1
154	7-8-65	Red Clay with Gravel	100.0	100.0	100.0	100.0	68.9	47.2	31.9	31.7	14.1

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	No.10	Mechanical Analysis % Passing No.10	No.200
155	7-8-65	Dark Tan Clay with Gravel	100.0	100.0	100.0	100.0	62.9	40.7	26.4	26.3	7.7
156	7-8-65	Tan Clayey Sand	100.0	100.0	100.0	100.0	60.2	39.3	24.3	24.2	4.7
157	7-7-65	Brown Sandy Gravel	100.0	100.0	100.0	100.0	60.3	38.2	22.6	17.1	3.0
158	7-26-65	Tan Sandy Gravel	100.0	100.0	100.0	100.0	65.9	38.4	32.4	23.4	4.1
159	7-26-65	Brown Sand	100.0	100.0	100.0	100.0	97.6	90.3	82.5	65.2	14.7
160	7-16-65	Brown Sand	100.0	100.0	100.0	100.0	97.8	95.8	93.1	59.8	8.2
161	7-16-65	Brown Sand	100.0	100.0	100.0	100.0	98.8	97.8	96.5	68.1	18.6
162	7 26-65	Red Sandy Clay	100.0	100.0	100.0	100.0	100.0	98.7	98.0	79.4	45.4
163	8-31-65	Tan Clay	100.0	100.0	100.0	100.0	100.0	100.0	98.3	80.9	47.0
164	8-31-65	Tan Clay	100.0	100.0	100.0	100.0	99.2	98.6	97.1	83.5	39.4
165	7-19-65	Brown Sand	100.0	100.0	100.0	100.0	92.9	82.2	68.4	53.7	7.7
167	7-23-65	Tan Sand	100.0	100.0	100.0	100.0	99.0	96.7	92.2	59.2	5.5
168	7-16-65	Tan Sand	100.0	100.0	100.0	100.0	100.0	100.0	98.6	62.3	8.3
170	7-23-65	Red Sand	100.0	100.0	100.0	100.0	88.2	71.9	59.7	40.5	11.1

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
171	7-7-65	Red Sand	100.0	100.0	100.0	100.0	90.6	78.7	70.1	51.7	11.8
172	7-19-65	Tan Sand	100.0	100.0	100.0	100.0	78.8	51.9	29.1	11.7	3.0
173	7-23-65	Tan Sand	100.0	100.0	100.0	100.0	56.5	34.3	18.8	18.6	2.8
174	11-11-65	Donnafill	100.0	100.0	100.0	100.0	100.0	100.0	100.0	81.9	30.2
175	11-11-65	Donnafill	100.0	100.0	100.0	100.0	100.0	100.0	100.0	82.7	31.1
176	11-11-65	Donnafill	100.0	100.0	100.0	100.0	100.0	100.0	100.0	82.7	22.6
200	9-30-65	Tan Sandy Clay with Gravel	100.0	100.0	100.0	86.2	62.2	48.1	32.5	10.9	4.5
201	1-11-66	Tan Sandy Clay	100.0	100.0	100.0	100.0	76.7	63.3	41.6	9.3	2.9
202	1-6-66	Tan Sandy Clay	100.0	100.0	100.0	100.0	76.9	61.4	37.1	5.6	2.1
203	1-13-66	Sandy Clay with Gravel	100.0	100.0	100.0	85.9	62.3	48.8	32.7	7.9	2.4
204	1-12-66	Tan Sandy Gravel	100.0	100.0	100.0	100.0	76.2	58.8	38.9	9.3	3.1
205	1-13-66	Tan Sandy Gravel	100.0	100.0	100.0	100.0	74.7	58.7	35.6	6.5	2.2
206	1-10-66	Tan Sandy Gravel	100.0	100.0	100.0	100.0	78.5	64.5	45.4	7.2	1.9
207	1-12-66	Tan Sandy Gravel	100.0	100.0	100.0	100.0	75.9	59.8	38.3	10.3	2.2

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
208	1-11-66	Tan Sandy Gravel	100.0	100.0	100.0	100.0	73.2	55.8	30.4	8.3	2.9
209	10-6-65	Sandy Clay with Gravel	100.0	100.0	100.0	86.9	59.2	43.6	22.1	6.1	2.4
210	9-24-65	Yellow Clayey Sand	100.0	100.0	100.0	100.0	71.6	42.2	27.1	12.6	5.5
211	9-30-65	Gray Sand	100.0	100.0	100.0	66.5	36.3	32.1	18.5	9.7	4.6
212	9-28-65	Yellow Clayey Sand	100.0	100.0	100.0	100.0	72.1	49.9	32.6	19.8	8.1
213	9-30-65	Yellow Clayey Sand	100.0	100.0	100.0	78.7	46.4	31.1	17.2	9.4	4.0
214	9-29-65	Yellow Clayey Sand	100.0	100.0	100.0	65.2	17.3	12.6	6.6	4.6	2.2
215	9-24-65	Yellow Sandy Clay	100.0	100.0	100.0	100.0	72.2	55.3	35.7	24.3	8.5
216	10-4-65	Yellow Clayey Sand	100.0	100.0	100.0	100.0	73.7	50.7	32.3	7.8	2.7
217	9-27-65	Gray Sandy Silt	100.0	100.0	100.0	68.9	42.2	37.3	19.2	11.4	5.3
218	10-4-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	60.2	39.4	20.6	6.9	2.7
219	10-6-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	63.6	44.7	28.8	17.3	7.8
220	1-14-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	92.6	53.9	32.3	17.2	8.1
221	10-14-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	52.9	31.5	16.5	8.7	6.5

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
222	10-21-65	Yellow Sandy Clay	100.0	100.0	100.0	77.4	45.4	31.9	20.1	12.1	6.7
223	10-14-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	77.5	52.1	26.9	12.7	6.0
224	1-13-66	Gray Sandy Silt	100.0	100.0	100.0	100.0	6.9	47.8	30.5	19.5	10.7
225	1-10-66	Gray Sandy Silt	100.0	100.0	100.0	100.0	72.7	49.9	31.5	16.4	5.8
226	1-14-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	71.4	50.6	30.8	20.8	11.3
227	10-11-65	Gray Sandy Silt	100.0	100.0	100.0	77.3	47.3	32.2	21.9	13.8	4.4
228	10-20-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	65.8	44.1	22.4	11.3	5.9
229	10-6-65	Gray Sandy Silt	100.0	100.0	100.0	75.4	43.7	25.5	16.4	8.2	3.5
230	10-11-65	Brown Clayey Sand	100.0	100.0	100.0	100.0	74.4	58.0	42.3	28.2	7.3
231	10-12-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	70.7	46.8	29.6	10.7	4.9
232	3-19-66	Gray Silt	100.0	100.0	100.0	100.0	69.6	46.9	30.7	12.2	5.3
233	3-19-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	71.0	55.3	37.5	25.5	7.5
234	1-10-66	Sandy Silt with Gravel	100.0	100.0	100.0	100.0	69.1	52.5	29.4	18.1	5.4
235	10-14-65	Gray Sandy Silt	100.0	100.0	100.0	55.4	31.4	29.1	10.2	6.6	3.1
236	3-21-66	Tan Sand	100.0	100.0	100.0	100.0	73.9	57.4	40.0	26.1	8.0

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
237	10-18-65	Gray Sandy Silt	100.0	100.0	100.0	78.9	47.1	32.2	18.8	7.3	2.9
238	10-20-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	72.4	50.3	25.7	10.3	4.1
239	1-7-66	Gray Sandy Silt	100.0	100.0	100.0	65.9	21.1	16.6	10.1	6.6	3.2
240	5-11-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	57.8	28.8	13.6	7.2	3.2
241	11-4-65	Gray Sandy Silt	100.0	100.0	100.0	67.7	25.5	21.4	12.7	6.6	0.4
242	1-6-66	Gray Sandy Silt	100.0	100.0	100.0	81.6	48.9	32.8	16.5	3.5	1.5
243	3-19-66	Gray Silt	100.0	100.0	100.0	100.0	69.7	47.1	32.0	18.6	7.5
244	1-6-66	Crushed Limestone	100.0	100.0	100.0	63.2	20.4	17.3	10.5	7.8	3.3
245	10-25-65	Gray Sandy Silt	100.0	100.0	100.0	100.0	70.6	47.7	34.9	19.7	8.7
246	1-9-66	Crushed Limestone	100.0	100.0	100.0	100.0	75.3	51.7	27.1	10.6	4.2
247	11-22-65	Crushed Limestone	100.0	100.0	100.0	71.3	42.0	30.6	21.6	12.6	4.2
248	11-1-65	Crushed Limestone	100.0	100.0	100.0	100.0	70.2	39.7	26.4	15.1	5.3
249	1-9-66	Tan Sandy Clay	100.0	100.0	100.0	100.0	74.8	59.0	33.7	18.7	6.1
250	1-8-66	Red Clay	100.0	100.0	100.0	100.0	99.4	99.1	98.0	74.7	33.3
251	1-7-66	Tan Clayey Sand	100.0	100.0	100.0	100.0	78.5	54.1	30.6	11.9	1.4

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing						Mechanical Analysis % Passing		
			2	1-1/2	1	3/4	3/8	No.4	No.10	No.40	No.200
252	1-8-66	Tan Clayey Sand	100.0	100.0	100.0	100.0	73.1	58.0	43.3	29.1	8.6
253	10-27-65	Gray Silty Sand	100.0	100.0	100.0	100.0	58.0	36.2	15.4	6.8	2.8
254	10-27-65	Gray Silt	100.0	100.0	100.0	100.0	63.1	42.1	19.3	8.2	3.4
255	10-25-65	Gray Sandy Silt	100.0	100.0	100.0	72.5	41.7	28.7	20.1	1.4	4.7
256	11-1-65	Gray Silty Sand	100.0	100.0	100.0	63.4	34.7	30.2	13.4	7.3	2.5
257	3-21-66	Gray Crushed Rock	100.0	100.0	100.0	48.8	18.8	16.2	6.9	3.9	1.7
258	3-19-66	Gray Crushed Rock	100.0	100.0	100.0	71.2	29.1	23.0	11.9	6.0	2.4
259	10-6-65	Tan Sandy Clay	100.0	100.0	100.0	100.0	74.8	58.3	41.9	31.5	10.5
260	10-5-65	Crushed Rock	100.0	100.0	100.0	69.5	30.1	25.1	13.6	7.8	3.9
261	10-5-65	Tan Silty Sand	100.0	100.0	100.0	100.0	74.7	56.4	39.1	25.7	8.3
262	10-5-65	Tan Silty Sand	100.0	100.0	100.0	100.0	73.3	57.6	40.7	29.1	8.6
263	10-5-65	Tan Silty Sand	100.0	100.0	100.0	100.0	75.8	57.2	35.5	22.5	7.1
264	10-1-65	Tan Silty Sand	100.0	100.0	100.0	100.0	74.3	59.1	39.0	27.9	9.3
265	10-1-65	Silty Sand with Gravel	100.0	100.0	100.0	100.0	69.4	51.5	32.2	29.5	11.9
266	10-1-65	Tan Silty Sand	100.0	100.0	100.0	100.0	69.8	50.9	30.9	22.9	9.3

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing						Mechanical Analysis % Passing		
			2	1-1/2	1	3/4	3/8	No.4	No.10	No.40	No.200
267	10-1-65	Tan Silty Sand	100.0	100.0	100.0	100.0	70.7	52.4	37.5	24.2	7.9
268	10-1-65	Tan Silty Sand	100.0	100.0	100.0	100.0	73.6	55.9	39.3	26.2	8.7
269	9-28-65	Tan Silty Sand	100.0	100.0	100.0	100.0	74.7	57.1	41.9	30.8	11.1
270	9-28-65	Silty Sand with Gravel	100.0	100.0	100.0	100.0	73.4	53.9	35.9	24.4	8.7
271	3-19-66	Tan Silt	100.0	100.0	100.0	100.0	39.1	17.3	9.4	5.7	1.9
272	3-19-66	Tan Silt	100.0	100.0	100.0	100.0	53.4	30.9	18.8	11.9	4.0
273	3-21-66	Tan Crushed Rock	100.0	100.0	100.0	100.0	48.8	24.1	13.3	9.3	3.2
274	3-25-66	Tan Crushed Rock	100.0	100.0	100.0	100.0	45.2	22.4	13.9	9.1	3.0
275	3-25-66	Tan Crushed Rock	100.0	100.0	100.0	100.0	57.1	33.3	21.6	12.7	4.3
276	3-25-66	Silty Sand with Gravel	100.0	100.0	100.0	100.0	68.2	47.6	31.4	24.3	9.0
277	3-25-66	Brown Silty Sand	100.0	100.0	100.0	100.0	72.9	54.9	32.4	22.2	9.8
278	4-1-66	Brown Silty Sand	100.0	100.0	100.0	100.0	73.9	54.2	31.9	22.9	9.2
279	4-2-66	Brown Silty Sand	100.0	100.0	100.0	100.0	76.7	58.7	40.2	31.6	11.7
280	4-2-66	Tan Silt with Gravel	100.0	100.0	100.0	100.0	65.1	37.3	27.5	22.0	11.2

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
281	4-2-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	60.8	37.0	18.7	9.9	4.2
282	4-2-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	49.9	27.8	13.6	6.6	2.8
283	4-2-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	62.7	40.4	22.2	13.1	5.3
284	4-9-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	64.3	44.7	26.7	10.3	3.9
285	4-9-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	70.5	47.1	27.6	12.8	4.9
286	4-9-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	53.3	29.9	14.4	5.7	2.6
287	4-9-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	52.9	25.3	11.1	5.3	2.4
288	4-9-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	63.1	38.6	19.9	11.1	4.4
289	4-9-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	58.9	36.1	19.4	10.4	4.0
290	4-11-66	Gray Crushed Stone	100.0	100.0	100.0	100.0	72.2	51.1	32.3	17.4	6.7
291	1-14-66	Red Sandy Clay	100.0	100.0	100.0	83.2	61.2	49.9	33.4	15.1	2.9
292	1-14-66	Red Sandy Clay	100.0	100.0	100.0	86.0	66.3	55.2	38.2	23.7	4.1
293	1-15-66	Red Sandy Clay	100.0	100.0	100.0	84.3	60.8	49.7	34.1	19.4	3.6
294	1-15-66	Brown Sandy Gravel	100.0	100.0	100.0	85.7	63.2	52.0	38.2	23.2	3.8
295	1-15-66	Red Sandy Clay	100.0	100.0	100.0	88.5	68.7	56.9	39.9	22.9	4.0

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
296	1-15-66	Brown Sandy Clay	100.0	100.0	100.0	86.5	65.2	53.2	37.5	23.3	3.9
297	1-17-66	Brown Sandy Clay	100.0	100.0	100.0	86.7	66.1	54.4	37.3	21.7	4.1
298	1-17-66	Sandy Clay with Gravel	100.0	100.0	100.0	100.0	73.9	61.8	35.1	26.2	8.4
299	1-17-66	Brown Sandy Clay	100.0	100.0	100.0	84.9	63.5	52.2	34.8	18.9	3.4
300	1-18-66	Brown Sandy Clay	100.0	100.0	100.0	100.0	74.7	60.3	37.4	18.8	3.9
301	4-13-66	Gray Silt	100.0	100.0	100.0	100.0	40.7	20.9	12.7	8.7	3.5
302	4-13-66	Gray Silt	100.0	100.0	100.0	100.0	39.0	23.8	12.8	8.7	3.3
303	4-13-66	Gray Silt	100.0	100.0	100.0	100.0	42.6	25.0	13.5	9.2	3.7
304	4-13-66	Gray Silt	100.0	100.0	100.0	100.0	44.2	24.8	16.6	10.9	4.2
305	4-14-66	Gray Silt	100.0	100.0	100.0	100.0	41.2	23.4	14.2	10.6	4.3
306	4-14-66	Gray Silt	100.0	100.0	100.0	100.0	44.9	26.4	16.5	10.2	4.0
307	4-14-66	Gray Silt	100.0	100.0	100.0	76.5	40.5	26.3	14.0	7.3	2.9
308	4-14-66	Gray Silt	100.0	100.0	100.0	100.0	43.1	25.6	14.7	8.9	3.5
309	4-14-66	Gray Silt	100.0	100.0	100.0	100.0	45.9	28.7	16.4	9.4	3.6

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing						Mechanical Analysis % Passing		
			2	1-1/2	1	3/4	3/8	No.4	No.10	No.40	No.200
310	4-14-66	Gray Silt	100.0	100.0	100.0	100.0	43.8	23.7	17.1	11.9	4.6
311	4-14-66	Gray Silt	100.0	100.0	100.0	73.7	43.8	27.7	15.6	9.1	3.7
312	4-14-66	Gray Silt	100.0	100.0	100.0	77.6	43.2	24.7	12.6	7.9	3.3
313	4-23-66	Crushed Rock Fines	100.0	100.0	100.0	100.0	61.9	40.0	20.7	11.9	4.5
314	4-23-66	Gray Crushed Fines	100.0	100.0	100.0	83.0	51.2	31.8	15.1	9.3	4.3
315	4-30-66	Crushed Rock Fines	100.0	100.0	100.0	80.5	48.1	31.6	19.9	12.6	5.4
316	4-30-66	Crushed Rock Fines	100.0	100.0	100.0	74.3	40.9	23.7	12.1	7.9	3.7
317	4-30-66	Crushed Rock Fines	100.0	100.0	100.0	100.0	59.7	38.8	16.6	9.5	4.1
318	4-30-66	Crushed Rock Fines	100.0	100.0	100.0	100.0	1.1	37.6	15.5	9.6	4.5
319	4-30-66	Crushed Rock Fines	100.0	100.0	100.0	100.0	67.8	48.3	25.3	13.7	5.9
320	4-30-66	Crushed Rock Fines	100.0	100.0	100.0	100.0	65.2	43.3	22.2	15.9	5.3
321	5-14-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	37.1	26.7	17.6	15.1	4.9
322	5-14-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	50.7	35.1	22.9	17.9	6.1
323	5-14-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	55.4	40.5	27.3	23.0	8.3
324	5-14-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	46.1	34.6	24.6	22.0	7.4

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
325	5-14-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	45.4	28.8	17.8	9.9	4.6
326	5-14-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	41.1	25.6	15.7	10.8	4.9
327	5-16-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	46.5	28.9	17.6	11.1	5.0
328	5-16-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	50.5	37.2	26.8	22.9	8.1
329	5-16-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	46.4	33.4	22.8	19.8	6.9
330	5-16-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	51.5	38.9	26.8	23.2	7.6
331	5-16-66	Tan Sandy Silt	100.0	100.0	100.0	100.0	55.8	28.4	9.4	4.6	2.9
332	5-20-66	White Rock Fines	100.0	100.0	100.0	100.0	58.2	33.0	15.6	6.6	3.7
333	5-20-66	White Rock Fines	100.0	100.0	100.0	100.0	60.2	33.1	14.4	8.1	5.4
334	5-20-66	White Rock Fines	100.0	100.0	100.0	100.0	42.9	22.5	9.4	4.6	2.7
335	5-20-66	White Rock Fines	100.0	100.0	100.0	100.0	56.1	32.7	15.6	8.3	4.9
336	5-20-66	White Rock Fines	100.0	100.0	100.0	100.0	50.1	20.4	10.6	6.1	3.8
337	5-21-66	White Rock Fines	100.0	100.0	100.0	100.0	59.2	37.8	22.5	12.4	6.8
338	5-21-66	White Rock Fines	100.0	100.0	100.0	100.0	62.6	43.3	24.7	12.7	7.2
339	5-21-66	Brown Sand with Gravel	100.0	100.0	100.0	100.0	67.5	51.7	40.9	22.4	5.1

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
340	5-21-66	Brown Sand	100.0	100.0	100.0	100.0	74.2	57.5	42.4	21.0	5.2
341	5-21-66	Brown Sand	100.0	100.0	100.0	88.2	67.0	54.2	39.4	15.1	1.8
342	5-21-66	Brown Sand	100.0	100.0	100.0	89.8	68.4	54.7	38.2	15.7	1.7
343	5-21-66	Brown Sand	100.0	100.0	100.0	100.0	70.4	53.0	39.1	20.2	4.4
344	5-24-66	Brown Sand	100.0	100.0	100.0	100.0	72.1	54.9	43.1	19.3	4.2
345	5-24-66	Brown Sand	100.0	100.0	100.0	100.0	70.0	53.7	43.4	21.4	4.9
346	6-25-66	Brown Sand	100.0	100.0	100.0	100.0	70.5	53.6	31.7	14.6	4.3
347	6-25-66	Brown Sand	100.0	100.0	100.0	100.0	77.6	59.5	35.9	12.5	1.1
348	6-25-66	Brown Sand	100.0	100.0	100.0	90.8	68.8	54.1	31.9	11.5	1.2
349	6-25-66	Brown Sand	100.0	100.0	100.0	100.0	77.5	61.2	31.4	8.3	1.0
350	6-25-66	Brown Sand	100.0	100.0	100.0	100.0	72.8	56.9	15.4	4.4	1.3
353	8-30-66	Sand with Gravel	100.0	100.0	100.0	100.0	63.0	44.0	26.5	16.5	2.9
354	8-31-66	Sand with Gravel	100.0	100.0	100.0	78.9	43.7	29.4	18.3	10.3	1.9
355	8-31-66	Tan Clay	100.0	100.0	100.0	100.0	80.8	63.0	45.9	31.7	15.8
356	8-31-66	Brown Gravel	100.0	100.0	100.0	86.1	55.5	39.1	24.1	17.7	3.8

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
357	9-1-66	Brown Gravel	100.0	100.0	100.0	80.6	45.5	30.4	20.8	13.2	2.4
358	9-1-66	Brown Gravel	100.0	100.0	100.0	100.0	83.0	64.9	42.7	31.0	15.3
359	9-1-66	Brown Gravel	100.0	100.0	100.0	87.6	62.7	48.6	34.5	24.8	4.6
360	9-2-66	Brown Gravel	100.0	100.0	100.0	100.0	70.4	53.8	33.8	22.1	3.8
361	9-2-66	Brown Gravel	100.0	100.0	100.0	100.0	74.4	59.2	35.0	22.9	3.8
362	9-6-66	Brown Gravel	100.0	100.0	100.0	89.4	65.6	50.7	28.3	17.6	2.3
363	9-6-66	Brown Gravel	100.0	100.0	100.0	100.0	67.9	51.1	32.1	22.8	3.9
364	9-6-66	Tan Clay	100.0	100.0	100.0	100.0	91.2	84.6	72.4	50.4	23.4
365	9-6-66	Tan Clay	100.0	100.0	100.0	100.0	87.9	79.6	63.2	44.2	23.9
400	1-16-66	Sandy Silt with Gravel	100.0	100.0	100.0	100.0	76.5	61.1	46.8	44.0	20.9
401	7-21-66	Sand and Gravel	100.0	100.0	100.0	84.7	64.9	52.7	38.8	17.7	5.2
402	7-21-66	Sand	100.0	100.0	100.0	100.0	78.8	64.1	49.0	30.4	7.7
403	7-21-66	Black Organic Clay	100.0	100.0	100.0	100.0	94.6	91.5	73.9	70.6	63.3
404	7-22-66	Red Clayey Sand with Gravel	100.0	100.0	100.0	100.0	73.4	56.7	38.9	16.6	4.6

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
405	7-22-66	Gray Silty Sand	100.0	100.0	100.0	100.0	96.8	94.2	90.8	75.3	26.2
406	7-25-66	Sand and Gravel	100.0	100.0	100.0	82.2	55.1	41.9	31.9	22.8	3.8
407	7-25-66	Silt	100.0	100.0	100.0	100.0	99.4	99.0	98.3	93.7	91.0
408	7-25-66	Sand	100.0	100.0	100.0	100.0	98.6	97.6	95.5	92.7	22.4
409	7-26-66	Red Sand	100.0	100.0	100.0	100.0	76.3	62.7	46.0	20.2	5.2
410	7-26-66	Sand	100.0	100.0	100.0	100.0	96.9	95.2	91.6	88.4	85.1
411	7-26-66	Sand and Gravel	100.0	100.0	100.0	82.4	55.7	45.5	35.4	26.0	8.6
412	7-26-66	Loess	100.0	100.0	100.0	100.0	99.8	99.4	98.9	96.9	89.2
413	7-26-66	Silty Sand with Gravel	100.0	100.0	100.0	100.0	73.2	54.9	34.9	23.0	8.8
414	7-27-66	Yellow Clay	100.0	100.0	100.0	100.0	99.9	99.9	99.5	95.8	89.4
415	7-29-66	Stone Fines	100.0	100.0	100.0	100.0	62.3	43.9	24.4	15.9	9.4
416	8-29-66	Silty Sand	100.0	100.0	100.0	100.0	99.9	99.7	99.4	98.4	33.6
417	8-29-66	Silty Sand	100.0	100.0	100.0	100.0	99.2	98.7	96.8	95.7	24.4
418	8-29-66	Gravel and Sand	100.0	100.0	100.0	100.0	79.5	59.7	38.9	25.6	9.7

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
419	8-30-66	Stone Fines	100.0	100.0	100.0	100.0	69.0	54.3	33.6	18.1	10.0
420	8-30-66	Stone Fines	100.0	100.0	100.0	100.0	69.3	48.4	25.7	16.8	10.5
421	8-30-66	Brown Sandy Gravel	100.0	100.0	100.0	100.0	86.7	71.7	54.4	46.9	12.9
422	8-30-66	Tan Silt	100.0	100.0	100.0	100.0	99.7	98.5	94.6	91.9	78.1
423	8-31-66	Organic Clay	100.0	100.0	100.0	100.0	96.3	93.2	86.8	81.7	70.9
424	8-31-66	Gravel and Red Sand	100.0	100.0	100.0	80.6	62.3	47.8	32.1	20.6	6.6
425	9-1-66	Sand	100.0	100.0	100.0	100.0	99.9	99.8	99.5	99.2	6.5
427	9-1-66	Gravel and Sand	100.0	100.0	100.0	82.1	52.9	40.8	30.3	15.6	5.7
430	9-1-66	Black Silty Sand	100.0	100.0	100.0	100.0	99.8	99.6	98.2	95.8	43.6
431	9-2-66	Gravel and Sand	100.0	100.0	100.0	100.0	76.3	58.9	45.0	13.6	5.1
432	9-2-66	Sand	100.0	100.0	100.0	100.0	98.2	97.3	96.0	91.9	77.5
433	9-6-66	Black Clay	100.0	100.0	100.0	100.0	99.7	99.7	99.1	98.7	89.3
434	9-7-66	Tan Clay	100.0	100.0	100.0	100.0	85.2	76.8	59.4	41.1	39.4
435	9-7-66	Black Clay	100.0	100.0	100.0	100.0	99.9	99.9	99.7	99.1	66.3
501	10-17-67	Sandy Clay with Gravel	100.0	100.0	100.0	100.0	79.9	67.1	44.1	30.3	8.3

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
502	10-2-67	Tan Clay	100.0	100.0	100.0	100.0	99.6	99.4	98.7	95.0	86.1
503	10-23-67	Sand	100.0	100.0	100.0	100.0	84.4	69.4	49.8	27.7	8.7
504	10-3-67	Silty Sand	100.0	100.0	100.0	100.0	99.9	99.4	99.2	94.6	65.8
505	10-11-67	Sand	100.0	100.0	100.0	100.0	100.0	100.0	100.0	84.8	26.4
506	9-28-67	Black Clay	100.0	100.0	100.0	100.0	100.0	100.0	62.0	60.4	55.4
507	10-18-67	Gravel and Sand	100.0	100.0	100.0	100.0	81.8	68.5	44.5	24.4	6.4
508	10-3-67	Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	78.5	11.1
509	9-28-67	Black Silty Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.7	97.4	84.2
510	10-16-67	Black Silty Sand	100.0	100.0	100.0	100.0	45.4	28.4	14.1	11.5	5.4
511	10-10-67	Gravel and Sand	100.0	100.0	100.0	100.0	80.4	65.9	44.7	23.6	6.2
512	10-11-67	Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	99.6	6.7
513	9-28-67	Black Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.7	98.7	93.3
514	10-23-67	Gravel and Sand	100.0	100.0	100.0	100.0	80.3	67.5	45.1	30.3	7.6
515	9-28-67	Tan Clay	100.0	100.0	100.0	100.0	99.5	99.1	92.9	90.9	87.9
516	10-23-67	Gravel and Sand	100.0	100.0	100.0	100.0	70.6	48.1	33.8	22.6	5.7

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
517	9-27-67	Sandy Silt	100.0	100.0	100.0	100.0	99.6	98.8	97.8	96.7	85.1
518	10-18-67	Gravel and Sand	100.0	100.0	100.0	100.0	71.4	49.9	27.1	23.7	9.1
519	10-3-67	Clayey Sand	100.0	100.0	100.0	100.0	99.8	98.6	95.4	80.4	7.3
520	10-2-67	Yellow Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.4	97.9	59.9
521	10-16-67	Black Sandy Silt	100.0	100.0	100.0	100.0	71.9	55.1	31.7	24.7	15.1
522	10-11-67	Gravel and Sand	100.0	100.0	100.0	100.0	77.9	57.9	36.3	27.5	10.9
523	10-10-67	Sand	100.0	100.0	100.0	100.0	99.2	98.8	98.2	71.7	2.8
524	10-10-67	Gravel with Fine Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.2	98.6	62.5
525	9-25-67	Tan Clay	100.0	100.0	100.0	100.0	99.9	99.8	99.6	99.3	92.3
526	10-16-67	Gravel and Red Silt	100.0	100.0	100.0	100.0	76.8	57.9	32.1	26.3	16.8
527	9-26-67	Red Clayey Sand	100.0	100.0	100.0	100.0	99.7	99.5	99.0	98.8	61.4
528	10-13-67	Gravel with Fine Sand	100.0	100.0	100.0	100.0	82.9	66.3	41.7	29.3	14.5
529	10-13-67	Fine Sand	100.0	100.0	100.0	100.0	94.1	88.3	77.6	72.6	28.7
530	10-17-67	Gravel with Fine Sand	100.0	100.0	100.0	100.0	74.5	58.7	33.9	20.8	12.3
531	9-19-67	Black Clay with Gravel	100.0	100.0	100.0	100.0	89.1	73.7	49.2	43.7	34.4

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
532	10-17-67	Fine Sand	100.0	100.0	100.0	100.0	77.0	60.1	42.5	29.2	9.1
533	9-27-67	Fine Sand	100.0	100.0	100.0	100.0	97.3	93.4	90.5	86.2	14.5
534	10-16-67	Fine Red Sand	100.0	100.0	100.0	100.0	82.6	69.0	52.2	39.9	16.4
535	10-3-67	Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.9	98.9	15.9
536	10-11-67	Sand	100.0	100.0	100.0	68.7	31.3	20.3	12.9	9.5	4.3
537	10-3-67	Silty Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.6	99.5	18.1
538	9-25-67	Tan Clay with Gravel	100.0	100.0	100.0	100.0	100.0	100.0	99.0	98.5	43.9
539	10-23-67	Gravel with Silty Sand	100.0	100.0	100.0	100.0	68.8	49.9	36.3	25.8	8.1
540	9-10-67	Yellow Silt	100.0	100.0	100.0	100.0	94.2	84.0	68.6	62.0	39.4
541	10-10-67	Sand	100.0	100.0	100.0	100.0	82.4	63.8	41.4	24.7	7.2
542	10-19-67	Crushed Limestone	100.0	100.0	100.0	100.0	67.6	45.9	24.6	13.6	6.6
543	10-3-67	Gravel and Sand	100.0	100.0	100.0	100.0	77.1	59.5	41.4	25.5	5.6
544	10-3-67	Fine Sand	100.0	100.0	100.0	100.0	92.6	86.7	78.2	69.7	11.7
545	9-27-67	Yellow Silt	100.0	100.0	100.0	100.0	98.7	96.8	90.4	88.4	59.2

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
546	10-13-67	Fine Sand	100.0	100.0	100.0	100.0	66.0	52.2	27.3	22.0	10.2
547	9-10-67	Brown Silt	100.0	100.0	100.0	100.0	97.4	91.7	81.9	79.3	73.3
548	10-18-67	Gravel and Sand	100.0	100.0	100.0	100.0	69.1	49.7	29.5	18.6	6.5
549	9-27-67	Brown Silt	100.0	100.0	100.0	100.0	99.6	98.9	98.7	97.1	92.4
550	10-23-67	Gravel and Fine Sand	100.0	100.0	100.0	100.0	81.8	61.9	46.7	32.6	20.8
551	10-3-67	Sandy Clay	100.0	100.0	100.0	100.0	99.8	99.5	99.1	98.9	65.7
552	10-18-67	Gravel and Fine Sand	100.0	100.0	100.0	100.0	72.5	54.2	36.9	29.6	17.1
553	9-26-67	Gray Silt	100.0	100.0	100.0	100.0	100.0	100.0	99.3	98.9	82.8
554	10-23-67	Gravel and Fine Sand	100.0	100.0	100.0	100.0	94.0	55.6	34.9	27.9	12.0
555	10-3-67	Gray Silt	100.0	100.0	100.0	100.0	99.9	99.6	99.0	98.6	71.2
556	10-3-67	Silty Sand	100.0	100.0	100.0	100.0	66.3	60.6	34.7	25.3	12.3
557	10-11-67	Gravel and Sand	100.0	100.0	100.0	100.0	76.2	60.6	43.8	23.7	10.6
558	10-9-67	Clayey Silt	100.0	100.0	100.0	100.0	99.6	98.7	97.0	80.8	27.6
559	9-27-67	Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	98.6	96.9	66.3
560	10-13-67	Silty Sand with Gravel	100.0	100.0	100.0	100.0	77.1	58.9	38.9	30.3	13.8

Summary of Data

Soil Sample Number	Date Tested	Visual Description	Air Dried Preparation % Passing 2	1-1/2	1	3/4	3/8	No.4	Mechanical Analysis % Passing No.10	No.40	No.200
561	9-26-67	Yellow Silt	100.0	100.0	100.0	100.0	98.1	96.4	92.7	91.1	82.1
562	10-13-67	Silty Sand with Gravel	100.0	100.0	100.0	100.0	55.6	47.8	32.9	29.9	14.2
563	10-2-67	Clayey Sand	100.0	100.0	100.0	100.0	100.0	100.0	99.8	99.8	24.9
564	10-12-67	Fine Sand	100.0	100.0	100.0	100.0	66.8	46.6	23.9	19.2	12.6
565	10-10-67	Gravel and Sand	100.0	100.0	100.0	100.0	78.2	62.0	39.7	26.7	10.6
566	9-25-67	Black Clay	100.0	100.0	100.0	100.0	99.9	99.4	98.5	96.6	93.4
567	10-23-67	Gravel and Sand	100.0	100.0	100.0	100.0	79.9	60.5	37.9	23.1	7.9
568	10-3-67	Black Clay	100.0	100.0	100.0	100.0	100.0	100.0	99.3	95.5	90.3
569	10-17-67	Sand	100.0	100.0	100.0	100.0	62.8	46.1	24.9	13.8	9.1
570	10-11-67	Sand	100.0	100.0	100.0	100.0	85.6	70.4	45.2	38.8	13.3
571	9-25-67	Silty Sand	100.0	100.0	100.0	100.0	99.7	99.4	99.1	98.0	45.4