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STATE OF NEVADA
1996 TAHOE BOND ACT

PROJECT AGREEMENT

Participant Douglas County Project Number 2001-020

Project Title: Round Hill GID – SEZ Restoration, Water Quality/Erosion Control Project
Period Covered By This Agreement: September 1, 2000 - Dec 31, 2003

Tax ID Number _____

Total Project Costs:

A.	Estimated Project Cost (Design and Construction)	$1,556,192.00
B.	Local Share of Project Cost (25% of A)	$ 389,048.00
C.	State Share of Project Cost (75% of A)	$1,167,144.00
D.	State Share of Administration costs (3% of A)	$ 46,685.76
E.	**Total State Grant (C plus D)**	**$1,213,829.70**

Refer to A: Design and Construction Costs are estimated at $1,556,192.00

Refer to B: Douglas County is responsible for 25% of the ACTUAL costs of the design and construction of the project. This is estimated to be $398,048, however, the 25% will adjust to actual expenditures of the project design and construction.

Refer to C: The State is responsible for 75% of the ACTUAL costs of design and construction. This is estimated to be $1,167,144.00, however, the 75% will adjust to actual expenditures of the project design and construction. [Note: Expenditures above the approved grant amount require prior approval by the State to be eligible for reimbursement. Please refer to condition #11 under this agreement.]

Refer to D: Administrative costs – 3% of Project Cost, is estimated at $46,685.76. The County is not required to match any portion of this 3%. These administrative costs will adjust to actual expenditures of the project design and construction. The County will receive 3% of the total costs of the Project to aid in covering administrative costs of the GID and the County directly related to this project.

Project Scope (Description of Project) – This grant agreement is for design and construction of: storm water treatment/infiltration basins and other water quality erosion control features, sand/grease removal pre-treatment vaults, storm drain piping and inlets, slope stabilization and revegetation, storm water conveyance and energy dissipation devices. This project also includes SEZ restoration of asphalted SEZ drainages.

TERMS AND CONDITIONS

The State of Nevada, represented by the Division of State Lands (DIVISION), or it's representative from the Nevada Division of Conservation Districts, and Douglas County (GRANTEE), mutually agree to perform this Agreement with the terms, promises, conditions, plans, specifications, estimates, procedures, project proposals, maps and assurances attached hereto and hereby made a part hereof.

In addition, the following attachments are hereby incorporated into this agreement:

Exhibit A. Grant application
Exhibit B. Tahoe Bond Act regulations – LCB File No. R022-00, NAC 321.335-360.
Exhibit C. Tahoe Bond Act Revegetation Guidelines

1. In the event the GRANTEE does not make available to the DIVISION all necessary information to finalize the project agreement within (6) months from the beginning date of this Agreement, this Agreement is null and void.

2. The GRANTEE hereby promises, in consideration of the promises made by the DIVISION herein, to execute the project described above in accordance with the terms of the Agreement.

3. The Project shall be operated and maintained by the GRANTEE for at least 20 (twenty) years after Project completion. Failure to perform such maintenance shall require repayment of the grant amount for the pro-rate portion of the remaining life of the project not maintained.

4. Work performed prior to the period specified in the "Project Agreement" may be eligible for reimbursement through Tahoe Bond Act provided:

   a. The applicant provides documentation detailing the work performed;
   b. The applicant provides documentation that the work performed related directly towards project implementation;
   c. The work performed is considered eligible for reimbursement per Tahoe Bond Act regulations; and
   d. The total grant amount specified in the project agreement does not increase.

5. The DIVISION and the Nevada Tahoe Conservation District will be invited to attend all major project issue meetings.

6. The DIVISION and the Nevada Tahoe Conservation District will be notified by the GRANTEE, and given the opportunity to review the Project design and/or construction, at the completion of the following Project milestones:

   Project Initiation after grant award
   Completion of 25, 50, and 90 percent of the Project design
   Expenditure of 25, 50 and 75 percent of the Total Project Cost
   Final Design Prior to advertisement
   Project completion

7. The GRANTEE shall supply the DIVISION and the Nevada Conservation District with timely copies of all construction plans at 25%, 50% and 90%, and the final bid package, prior to advertisement of bids. The DIVISION shall receive any as-built drawings completed by the GRANTEE showing all facilities, revegetation, and structures constructed as part of the project.

8. The GRANTEE must receive notice to proceed from the DIVISION prior to advertisement of bids and commencement of construction. All reimbursements to the GRANTEE from the DIVISION may be held until final plans are received, reviewed and notice to proceed is given by the DIVISION.

9. At least 75% of all hard or soft coverage, as defined by the Tahoe Regional Planning Agency Code of Ordinances, that is restored using State of Nevada funding and results in "banked coverage", will become the property of the State of NV unless otherwise agreed to by the State.

10. The DIVISION will be notified immediately of any changes regarding the cost of the project or the scope of work. Contacts are as follows:

    Nevada Division of State Lands
    Jenny Scanland
    333 S. Carson Meadows Ste #44
    Carson City, NV 89701
    PH (775) 687-3903
    FAX (775) 687-4742

11. Requests for funds exceeding this grant amount or major changes in project scope, require an amendment to this agreement and must be approved by the State Lands Registrar. Requests for funds that exceed 25 (twenty-five) percent of the original grant amount will also require the review of the Tahoe Bond Act Technical Advisory Committee including the Nevada Tahoe Conservation District Board of Supervisors.

12. Grant payments are on a reimbursement basis only. Requests for reimbursements must utilize the "Outlay Report and Request for Reimbursement For Construction Program" provided by the DIVISION. All reimbursements must include supporting documentation, including, but not limited to, invoices, receipts details outlining the basis for the expenditures, and the signature of the official responsible for approving the expenditures. The DIVISION reserves the right to request any additional information, related to project expenses that the DIVISION determines is necessary to process a grant payment.

13. The DIVISION may audit project records or it's designate. All records must be retained a minimum of 3 (three) years after the completion of work on the Project. The DIVISION reserves the right to require that the records be kept for a longer period of time.

14. The GRANTEE is responsible for obtaining all permits, easements and other private and governmental agency approvals required for the Project prior to the commencement of construction.

15. To the fullest extent permitted by law, the GRANTEE agrees to indemnify, hold harmless and defend the State of Nevada, it's officers, employees, agents and invitees from and against all liabilities, claims, actions, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of any alleged negligent or willful acts or omissions of the GRANTEE, its officers, employees and agents.

16. The failure of either party to enforce any provision of the Agreement shall not be construed as a waiver of limitation of that party's right to subsequently enforce and compel strict compliance with every provision of this Agreement.

17. This Agreement may be modified or amended if the amendment is made in writing and is signed by both parties.

18. If any provision of this Agreement shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any provision of the Agreement is invalid or unenforceable, but that by limiting such provision it would become valid and enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

19. The DIVISION may terminate this Agreement for reason of default by the GRANTEE. Any of the following events shall constitute default:
    a. Termination of the grant by reason or fault of the GRANTEE;
    b. Failure by the GRANTEE to observe any of the covenants, conditions, or warranties of this Agreement and its incorporated provisions;
    c. Failure by the GRANTEE to make progress on the project within the Period covered by this agreement;
    d. Unsatisfactory financial conditions of the GRANTEE which endanger the performance of the grant; and/or
    e. Delinquency by the GRANTEE in payments to contractors, except for those payments to contractors which are being contested in good faith by the GRANTEE.

20. If the Project is not completed, the GRANTEE is required to reimburse the DIVISION for funds expended for those portions of the Project that will not stand on their own, as determined by the DIVISION.

21. The DIVISION shall give notice to the GRANTEE if the GRANTEE is in default in the performance of any of the duties of the GRANTEE described in this agreement. The GRANTEE shall have 30 days from receipt of notice to remedy the default, and if the GRANTEE cannot remedy the default within such period of time, the DIVISION may terminate this agreement. The right of the DIVISION to terminate this agreement shall not impair any other rights or remedies at law or equity the DIVISION may have against the GRANTEE under this agreement or under the law. No waiver of any default by the DIVISION under this contract shall be held to be a waiver of any other subsequent default by the GRANTEE. All remedies afforded under this contract are cumulative; this is in addition to every other remedy provided therein or under the law.

22. The laws of the State of Nevada shall govern this Agreement.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date entered below.

STATE OF NEVADA
Division of State Lands

By _____
(Name)

Administrator
(Title)

3/4/02
(Date)

GRANTEE
Douglas County, Nevada

By Daniel C. Holler
(Name)

County Manager
(Title)

2-22-02
(Date)

Tahoe Bond Act 2001-020 Round Hill

<u>Exhibit A.</u> Grant application and all attachments 12/1/99.

Question 12 Bond Act
Grant Application Packet

August 1999
Nevada – Tahoe Conservation District
Nevada Division of Conservation Districts
Nevada Division of State Lands

Question 12 Bond Act Application

This document has been prepared to assist potential applicants in the process of applying for funding erosion control or stream restoration projects under the Question 12 Bond Act of 1996 (referred to as the Tahoe Bond Act of 1996 in this document).

This document includes the following items:

- Application Check List;
- Grant Application Form;
- Project Description Requirements;
- Summary Ranking Checklist;
- Project Agreement;
- Revegetation Guidelines.

These items identify the information necessary for the filing of a complete application for your project. Included with this information are 4 Appendices. Appendix A is a description of the criteria that will be used to evaluate your project. Appendix B describes the erosion control calculations that are necessary to estimate the potential benefits that result from the implementation of an erosion control project.

Appendix C is a listing of the Grant Application and Implementation Procedures. Appendix D is a copy of the Question 12 Project Cost Estimator that can be used to estimate the project's total cost. Appendix E contains a copy of the Nevada regulations that govern the Tahoe Bond Act grant process. Also attached are the Revegetation guidelines that all project proponents are expected for utilize to the fullest extent possible.

The completed application package should be submitted to the Nevada-Tahoe Conservation District, 870 Emerald Bay Road, South Lake Tahoe, CA, 96158.

After a complete grant application package has been submitted, it will first be reviewed by the Tahoe Bond Act Technical Advisory Committee (TAC). The TAC's recommended approval or disapproval of a project is given to the Nevada – Tahoe Conservation District Board. This Board's approval/disapproval recommendation is given to the State Land Registrar. The State Land Registrar makes the final decision on which projects are eligible for funding under the Tahoe Bond Act.

Tahoe Bond Act funds for approved projects will be reimbursed to applicants through their Counties, based on procedures outlined in the attached documents.

Any questions on the Tahoe Bond Act grant process should be directed to Jenny Scanland at the Nevada Division of State Lands (775- 687-3903) or Jason Shackelford at the Nevada – Tahoe Conservation District (530-573-2757).

GRANT APPLICATION CHECKLIST

The following checklist contains the list of items required for a Grant Application to be considered complete. A complete application is required before the project review can be initiated.

_____Completed Grant Application form (form attached).

_____Project Description requirements (see attached)

_____Assurances (form attached).

_____Resolution (sample attached) by the governing body designating person responsible for the project, and a statement that the governing body can finance 100% of its share of the project costs.

_____Completed Summary Ranking Checklist (attached form)

_____Signed Project Agreement

GRANT APPLICATION

A. Project Title: Round Hill G.I.D. Water Quality Improvement Project
(TRPA EIP project number pending)

B. Project Location: Round Hill Village Subdivision Unit No. 4
Round Hill – Nevada- Lake Tahoe
(see attached USGS quad map)

C. Brief Description: Erosion control and water quality improvements within the Round Hill subdivision. All improvements are limited to Round Hill GID R/W and/or easement areas, and USFS and Nevada State Lands parcels. Project elements include: slope stabilization, water quality vaults, storm drain, curb and gutter, revegetation, water quality basins and SEZ restoration.

D. Applicant's Name, Address and Phone Number:
Round Hill General Improvement District
Cameron McKay, District Manager
P.O. Box 976
Zephyr Cove, NV 89448
c/o Douglas County
P.O. Box 218
Minden, NV 89423
phone: (775) 588-2571 fax: (775) 588-5030 email:

E. Total Project Cost: $1,556,192.00
Tahoe Bond Act Grant Amount Requested: $1,167,144.00

F. Owner of Property: Round Hill General Improvement District (RHGID)
If others hold any outstanding property rights (additional owners, public/private easements, etc.), attach an explanation of how they will affect the project.

G. On behalf of the RHGID c/o Douglas County , I request this application be considered for financial assistance under the terms of the Tahoe Bond Act Grant Program.

Cameron McKay
(typed name)

C. McKay
Signature

District Manager
Title

February 15, 2001
Date

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A. PROJECT OBJECTIVES

This water quality project proposes improvements that will significantly reduce the amount of sediment entering the lake in the Tahoe Basin. The proposed improvements include slop stabilization, water quality vaults, storm drain, curb and gutter, revegetation, water quality basins and SEZ restoration. The proposed improvements are consistent with TRPA recommendations identified in the Douglas County/Round Hill Erosion Improvement Program (EIP). This project is recognized by TRPA under the project name **"ROUND HILL GID NEEDS (TRPA EIP # pending).**

B. PROJECT DESCRIPTION

PROJECT LOCATION

The Project site is located in the Round Hill Village Subdivision Unit No. 4 – Round Hill, Nevada. (See attached exhibit for location map.)

EXSITING CONDITIONS

Sediment and sand from deicing operations and slop erosion is currently allowed to wash through the existing storm drain system leading to the tributaries that drain to Lake Tahoe. The existing storm drain system was not designed with sediment collection or water quality improvement features. Consequently, most of the existing drainage inlets do not allow for sediment storage and water quality treatment. The lack of erosion control and sediment storage treatment has contributed to declining water quality within the watershed.

ANNUAL SEDIMENT PRODUCTION

An estimation of the annual sediment production was conducted to provide a baseline for the "before improvements" project conditions. A second empirical analysis was conducted assuming the project improvements were installed. (see Erosion calculations)

The analysis to estimate the benefits of the project improvements was conducted as follows:

1. Compute existing sediment production throughout the Water Quality Improvement Area.
2. Compute sediment production occurring after remediation.
3. Evaluate remediation measures (BMP's) and provide an engineer's estimate of project cost.
4. Determine the number of pounds of sediment removed for each dollar spent.

MAINTENANCE

The volume of storage depends on the number of times per year (frequency) the

treatment vaults are cleaned out. RHGID personnel indicated sediment removal operations vary depending on the severity of winter storms and summer thunderstorms. Frequency of treatment vault cleanings is dependent on the amount of sediment generated within a specific subarea. In most cases, three sediment removal maintenance operations per year were considered a reasonable cleaning frequency. Therefore, the required minimum storage volume within each treatment vault was assumed to be one-third of the calculated annual sediment accumulation at each treatment vault.

HYDROLOGY

A hydrologic analysis was conducted over the site watershed subareas that drain to the proposed storm drain improvements. Pursuant to TRPA requirements, peak flows from the 10-year, 24-hour design storm were analyzed to size the proposed storm drain conveyance system. Water quality treatment vault volume requirements were determined through analysis of the 20-year, 1-hour storm recurrence. Only the impervious surface area within the public right-of-way was considered for sizing the water quality treatment vaults.

Peak storm water run-off was estimated using the *SCS TR55* hydrology model. (see Attached TR55 data sheets) The SCS Type II precipitation distribution was used for all subareas within the watershed. The SCS Type II storm assumes a short duration, high intensity storm that is typical of a summer thunderstorm. The graphical and tabular hydrograph methods were used for single and multiple subarea analysis respectively. The estimated peak flows entering each of the proposed water quality treatment vaults are listed in the following table:

10-YEAR, 24-HOUR DESIGN STORM

SUB-AREA	AREA (AC)	WATER TREATMENT VAULT	FLOW (cfs)
Q1	1.2	DEVAUX LN.	2.0
Q2	0.69	ELKS PT. (N)	1.0
Q3	0.32	ELKS PT. (S)	1.0

The estimated peak volumes entering each of the proposed water quality basins are listed in the following table:

20-YEAR, 1-HOUR DESIGN STORM

SUB-AREA	AREA (AC)	WATER TREATMENT VAULT	VOLUME (ft^3)
Q1	1.2	DEVAUX LN.	4,333
Q2	0.69	ELKS PT. (N)	2,500
Q3	0.32	ELKS PT. (S)	1,167

PERMANENT BEST MANAGEMENT PRACTICES (BMP'S)

The "after improvements" sediment volume was estimated to determine the benefit of proposed improvements.

- **Revegetation of slopes** -- 70% reduction existing slope erosion.
- **New Catch Basins** -- 100% capture of sediment entering the drainage system (when adequately maintained).
- **Curb & Gutter** – Roadside ditch erosion eliminated for 100% reduction (paving). Sediment reaching the curb and gutter will be vacuumed by street sweepers or conveyed to catch basins for removal.
- **Water Quality Treatment Vaults** – 95% capture of sediment entering the drainage system (when adequately maintained). The treatment vaults remove sediment and oil from storm water.
- **Water Quality Treatment Basins** – Water quality treatment basins are proposed to provide detention, settlement, and infiltration of storm water. Sediment can settle out of storm water that enters a treatment basin.
- **Restoration of Existing Stream Environmental Zone (SEZ)** – Restoration and rehabilitation of existing damaged SEZ areas. Improvements include: land coverage removal, re-grading/re-contouring to establish "natural flood plain," SEZ vegetation.

CATCH BASINS

Type 4R curb inlet catch basins are specified as the replacement to the existing catch basins and for all new catch basins. The new Type 4R catch basins will provide a minimum of 24 inches of sump depth. The inside dimension of the catch basin is 24" X 36" corresponding to six (6) cubic feet of storage per vertical foot of sump. Thus, a standard 4R catch basin with 24-inch deep sump has a 12 cubic foot storage capacity.

The catch basins include special features that will enhance their inlet capacity and allow water to drain completely out. Design features include high inlet capacity vane grates (Neenah R3067-V or equivalent). The vane grates provide a higher inflow rate than standard grates with little increase in cost.

To eliminate pooling of water in the catch basin sumps, drainage holes are provided in the sides of the catch basins. The drainage holes are backed with drain rock wrapped in geotextile filter fabric so water can drain out. Allowing water to drain out of the

catch basins will reduce mosquito-breeding habitat.

CURB and GUTTER

Curb and gutter is proposed at various locations throughout the project area. Curb and gutter provides several functions as follows:

- Replace roadside channels with stable, low maintenance concrete gutter;
- Convey storm water run-off into the drainage collection system; and,
- Limit/restrict vehicle access to roadside shoulders.

Road deicing sand and incidental sediment will be collected and treated instead of flowing into natural waterways.

WATER QUALITY TREATMENT VAULTS

Three water quality treatment vaults are proposed with the project BMP's:

1. DEVAUX LANE.

A water quality treatment is proposed to treat the flow rate attributed to the impervious pavement surface within subarea Q1 (see Attached Figure). A peak 10-year, 24-hour flow rate from the upstream watershed is approximated to be 2cfs.

2. ELKS POINT ROAD (NORTH).

A water quality treatment is proposed to treat the flow rate attributed to the impervious pavement surface within subarea Q2 (see Attached Figure). A peak 10-year, 24-hour flow rate from the upstream watershed is approximated to be 1cfs.

3. ELKS POINT ROAD (SOUTH).

A water quality treatment is proposed to treat the flow rate attributed to the impervious pavement surface within subarea Q3 (see Attached Figure). A peak 10-year, 24-hour flow rate from the upstream watershed is approximated to be 1cfs.

WATER QUALITY BASINS:

1. DEVAUX LANE

This basin provides 4,333 cubic feet of storage volume.

2. ELKS POINT ROAD (NORTH)

This basin provides 2,500 cubic feet of storage volume.

3. ELKS POINT ROAD (SOUTH)

This basin provides 1,167 cubic feet of storage volume.

C. PROJECT SCHEDULE

Design: April 2001 – December 2001

Bid : March 2002

Construction: May 2002 – October 2002

D. PROJECT RESULTS

BENEFIT ANALYSIS

Sediment production is reduced by: Revegetation, retaining walls, street sweeping operations, sumps in catch basins, water quality treatment vaults, water quality basin, and SEZ restoration. The combined treatments remove nearly all sediment from storm water.

Maintenance crews will need to remove accumulations of sediment on a scheduled basis (two to three times per year is assumed the minimum cleaning frequency). Surface road sweeping and maintenance of the catch basins will significantly reduce the incidence of sediment reaching the lake.

Total Cost for the project improvements totals **$1,556,192.00. Nevada Tahoe Bond Act (State Dollars) = $1,167,144.00.** Corresponding Project improvements estimate a reduction of **291,360 lbs** of sediment per year. Assuming a 20 year life cycle, the benefit to cost ratio in pounds per dollar is listed as follows:

BENEFIT TO COST RATIO:

Project:

291,360 lbs/yr x 20 yrs = 3.74 lbs/$
$1,556,192.00

Nevada Tahoe Bond Act (State Dollars):

291,360 lbs/yr x 20 yrs = 4.99 lbs/$
$1,167,144.00

SUMMARY OF PROJECT

1. Revegetation of eroding areas;
2. Addition of a new storm water collection system with catch basins;
3. Construction of curb & gutter for drainage control;
4. Construction of water quality treatment vaults to allow treatment of storm water.
5. Use of Best Management Practices (BMP's) during construction activities and as necessary until the slopes are stabilized;
6. Construction of a new water quality treatment basins with controlled outlet structures and rock lined emergency outlets;
7. Construction of structural slope stabilization with revegetation;
8. Development of SEZ restoration on USFS and Nevada State Lands parcels.

E. PROJECT PARTICIPANTS

Round Hill GID and Douglas County are the project participants. Round Hill GID will issue and administer contract for the entire project, as well as the design and construction of the project. Round Hill GID will also be responsible for maintenance of the constructed facilities.

F. OPERATION & MAINTENANCE PROCEDURES

A maintenance schedule for the proposed improvements should be adopted by RHGID The maintenance schedule is essential in realizing intended long-term project objectives.

RHGID crews will maintain the storm drain system from two to three time per year. The frequency of those visits depends on the severity of storm events. Maintenance has primarily consisted of cleaning debris from the catch basin grates. Removing debris from the surface of the catch basin grates will continue to be necessary. RHGID indicated personnel and equipment required for maintenance is already available at the GID maintenance station.

Cost of sediment removal is estimated to be $22 per cubic yard. The annual sediment production (after improvements) was calculated to be approximately 134.88 cubic yards. Therefore, sediment removal costs can be expected to be in the range of $2,900 to $3,000 per year for the study area.

The maintenance schedule needs to provide flexibility to allow for immediate maintenance attention following a major storm event and after a major snowmelt. The maintenance schedule needs to include the following:

- Catch basin sumps need to be scheduled for cleaning out a minimum of two times per year. Extraordinary storm events will require special maintenance trips outside of the scheduled interval. Circumstances could occur that require cleaning of storm pipe. However, regular maintenance of the catch basins will reduce that possibility.
- Water quality treatment vaults will need to be maintained similarly to the catch basins. In addition to sediment removal, materials floating on the surface will need special attention. Oils and other petroleum products floating on the water surface will need to be removed and treated consistent with Chapter 81 of the TRPA code.
- The site BMP's should be inspected twice each year. Pursuant to TRPA requirements, a ledger must be kept to track maintenance activity of the Project drainage facilities. The ledger needs to record the date, description of work,

quantity of sediment removed, and location of sediment removal (each catch basin and drainage basin). A record of repair work to the catch basins, pipe culverts, and drainage basins must be included in the ledger.

- Revegetation of slopes and general maintenance of vegetation must continue as determined necessary (fertilization, replant, and irrigation).
- Gutters need to be cleaned (swept) twice a year to assure sufficient conveyance capacity is maintained. Sweeping operations should occur in the fall and after spring snow melt. Additional cleaning could be required as determined necessary.
- PCC curb and gutter destroyed during winter snow removal need to be replaced as soon as possible to ensure flow concentrations remain on the paved surface.
- Maintenance of drainage basins must also be considered. The maintenance frequency for the drainage basins will be less than that required for the catch basins. The basins need to be inspected at a minimum of once a year and work scheduled as determined necessary. Removal of accumulated sediment is necessary to maintain capacity of the basins.

ROUND HILL G.I.D. WATER QUALITY IMPROVEMENT PROJECT

Elks Point Road				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
SEZ	SF	25,800	$12	$309,600
Revegetation	SY	3,182	$18	$57,276
Retaining Wall	SF	1,050	$30	$31,500
Drop Inlets (Rehab)	EA	6	$2,500	$15,000
Water Quality Vaults	EA	2	$50,000	$100,000
Water Quality Basins	EA	2	$40,000	$80,000
			TOTAL	***$593,376***

Seminole Way / Hopi Ct				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	310	$25	$7,750
Revegetation	SY	477	$18	$8,586
Retaining Wall	SF	1,080	$30	$32,400
Drop Inlet (Rehab)	EA	1	$2,500	$2,500
			TOTAL	***$51,236***

Seminole Ct				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	400	$25	$10,000
Retaining Wall	SF	1,020	$30	$30,600
			TOTAL	***$40,600***

Paiute Drive				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	625	$25	$15,625
Revegetation	SY	557	$18	$10,026
			TOTAL	***$25,651***

Paiute Ct				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	200	$25	$5,000
Revegetation	SY	239	$18	$4,302
Retaining Wall	SF	690	$30	$20,700
			TOTAL	***$30,002***

ROUND HILL G.I.D. WATER QUALITY IMPROVEMENT PROJECT

Ute Way				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
SEZ	SF	16,200	$12	$194,400
Curb & Gutter	LF	425	$25	$10,625
Revegetation	SY	716	$18	$12,888
Drop Inlet (Rehab)	EA	1	$2,500	$2,500
			TOTAL	***$220,413***

Ute Ct				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	250	$25	$6,250
Catch Basin (New)	EA	1	$2,500	$2,500
Pipe	LF	110	$60	$6,600
			TOTAL	***$15,350***

Ohlone Ct				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Revegetation	SY	215	$18	$3,870
			TOTAL	***$3,870***

Cheyenne Cir				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Revegetation	SY	835	$18	$15,030
			TOTAL	***$15,030***

McFaul Way				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	2,100	$25	$52,500
Revegetation	SY	1,671	$18	$30,072
Retaining Wall	SF	1,500	$30	$45,000
Catch Basin (New)	EA	1	$2,500	$2,500
Pipe	LF	75	$60	$4,500
			TOTAL	***$134,572***

ROUND HILL G.I.D. WATER QUALITY IMPROVEMENT PROJECT

Kent Way				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	450	$25	$11,250
Revegetation	SY	1,352	$18	$24,344
Retaining Wall	SF	2,400	$30	$72,000
Drop Inlet (Rehab)	EA	1	$2,500	$2,500
			TOTAL	***$110,094***

Kent Ct				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	75	$25	$1,875
Snow Storage Basin	EA	1	$40,000	$40,000
			TOTAL	***$41,875***

Devaux Ln				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
SEZ	SF	12,000	$12	$144,000
Curb & Gutter	LF	315	$25	$7,875
Revegetation	SY	835	$18	$15,036
Drop Inlet (Rehab)	EA	1	$2,500	$2,500
Catch Basin (New)	EA	1	$2,500	$2,500
Pipe	LF	50	$60	$3,000
Water Quality Vault	EA	1	$50,000	$50,000
Water Quality Basin	EA	1	$40,000	$40,000
			TOTAL	***$264,911***

McFaul Ct				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
Curb & Gutter	LF	105	$25	$2,625
Revegetation	SY	366	$18	$6,587
			TOTAL	***$9,212***

ROUND HILL G.I.D. WATER QUALITY IMPROVEMENT PROJECT

Summary of Project				
Type of Improvement	**Unit**	**Quantity**	**Unit Cost**	**Subtotal**
SEZ	SF	54,000	$12	$648,000
Curb & Gutter	LF	5,255	$25	$131,375
Revegetation	SY	10,445	$18	$188,017
Retaining Wall	SF	7,740	$30	$232,200
Drop Inlet (Rehab)	EA	10	$2,500	$25,000
Catch Basins (New)	EA	3	$2,500	$7,500
Pipe	LF	235	$60	$14,100
Water Quality Vaults	EA	3	$50,000	$150,000
Water Quality Basins	EA	4	$40,000	$160,000
			TOTAL	***$1,556,192***

Erosion Control Calculations

JOB NO. 52059
DATE February 14, 2001
COMPUTED BY DLH

PROJECT: **ROUND HILL G.I.D.**
WATER QUALITY IMPROVEMENT PROJECT

Soil Erosion:

1. **Curb & Gutter**

Existing Channel Type: A
USLE Conversion Factor: 0.008 tons/ft/yr (<6%)
Effectiveness of Curb & Gutter: 100%
Length of Existing Channels: 5,255 LF

Annual Erosion = 5,255 LF (0.008 tons/ft/yr)(1.0)

Reduction = 42.04 tons/year

2. **Catch Basins & Drop Inlets**

Volume: 12 ft^3
% Captured/year: 15%
Soil Density: 80lb/ft^3
Number of Catch Basins: 13

Annual Erosion = 12 ft^3 (0.15)(80 lb/ft^3)(13) = 1,872 lbs/year

Reduction = 0.936 tons/year

3. **Water Quality Vaults**

Volume: 1.75 yds^3 = 47.25 ft^3
% Captured/year: 95%
Soil Density: 80 lb/ft^3
Number of Water Quality Vaults: 3

Annual Erosion = 47.25 ft^3 (0.95)(80 lb/ft^3)(3) = 10,773 lbs/year

Reduction = 5.39 tons/year

4. **Water Quality Basins**

Volume of Basins: (4,333 + 2,500 + 1,167)ft^3 = 8,000ft^3
% Captured/year: 1% of Volume
Soil Density: 80 lb/ft^3
Number of Water Quality Basins: 3

Annual Erosion = 8,000ft^3 (0.01)(80 lb/ft^3) = 6,400 lbs/year

Reduction = 3.2 tons/year

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Carson City, Nevada 89706
775-888-9992
(fax) 775-888-9994

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5. **Retaining Walls**

Exist 20' Rise x 30' Run: = 20 / 30 = 0.7

M = 0.5
S = 0.7

LS = $[2{,}360/72.6(\text{Cos}(\arctan 0.7))]^{0.5} + [(\sin(\text{arct } 0.7))/\text{Sin } 5.143]^{1.4}$

LS = 19.74

A_{walls} = 12(19.74) = 237 tons/Ac/year

Area of Walls = 7,740 ft^3 = 0.177Ac

Erosion = 237 tons/Ac/year x 0.177Ac = 42.11 tons/year on exist slopes

80% reduction with retaining walls: (0.80) (42.11 tons/yr)

Reduction = 33.69 tons/yr

6. **Revegetation**

USLE Equation for soil loss: A = R x K x LS x C x P tons/Acre/year

USLE Table A-3: R = 60
K = 0.20
C = 1.0
P = 1.0

USLE Table A-5: LS = 3.33

USLE Equation: A = 60 x 0.20 x 3.33 x 1.0 x 1.0
A = 39.96 tons/Acre/year

Treated Area: 10,445 SY = 2.16 Acres

Erosion = 2.16 Ac (39.96) = 86.31 tons/yr

70% reduction with revegetation: (0.70) (86.31 tons/yr)

Reduction = 60.42 tons/yr

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(fax) 775-888-9994

Reduction Summary:

Curb & Gutter	=	**42.04 tons/yr**
Catch Basins & Drop Inlets	=	**0.936 tons/yr**
Water Quality Vaults	=	**5.39 tons/yr**
Water Quality Basins	=	**3.2 tons/yr**
Retaining Walls	=	**33.69 tons/yr**
Revegetation	=	**60.42 tons/yr**
Total	=	***145.68 tons = 291,360 lbs Soil Erosion***

Total Project Cost = $1,556,192

Service Life = 20 years

lbs Soil reduced = 291,360 lbs

Benefit Cost Ratio (B/C)
[lbs Soil reduced x service life] / project cost = B (ft^3) / C ($)
B/C = (291,360 lbs x 20 yrs) / $1,556,1925

B/C = 3.74 lbs / Dollar

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Runoff Treatment:

Assume all catch basins are modified 4R's with average depth of 2 feet.

1. **Catch Basin & Drop Inlet Volume** = (13) x (3 ft wide) x (2 ft long) x (2 ft deep) = 156 ft^3

Assume Water Quality Vaults fill to approximately 6 feet.

2. **Water Quality Vault Volumes** = 850 ft^3

3. **Basin Volumes** = 8,000 ft^3

Total Project Cost = $1,556,192

Per Appendix B, Question 12 Bond Act Application Packet, assume each structure will fill with water 5 times each year.

Total Runoff Retention / year (TRR) = Σ[Structure Volume] x 5 = Retention in ft^3 per year

TRR = (156 + 850 + 8,000) x 5 = 45,030 ft^3/year

Benefit Cost Ratio (B/C)
[TRR x service life] / project cost = B (ft^3) / C ($)
B/C = (45,030 x 20) / $1,556,192

B/C = 0.58 ft^3/Dollar

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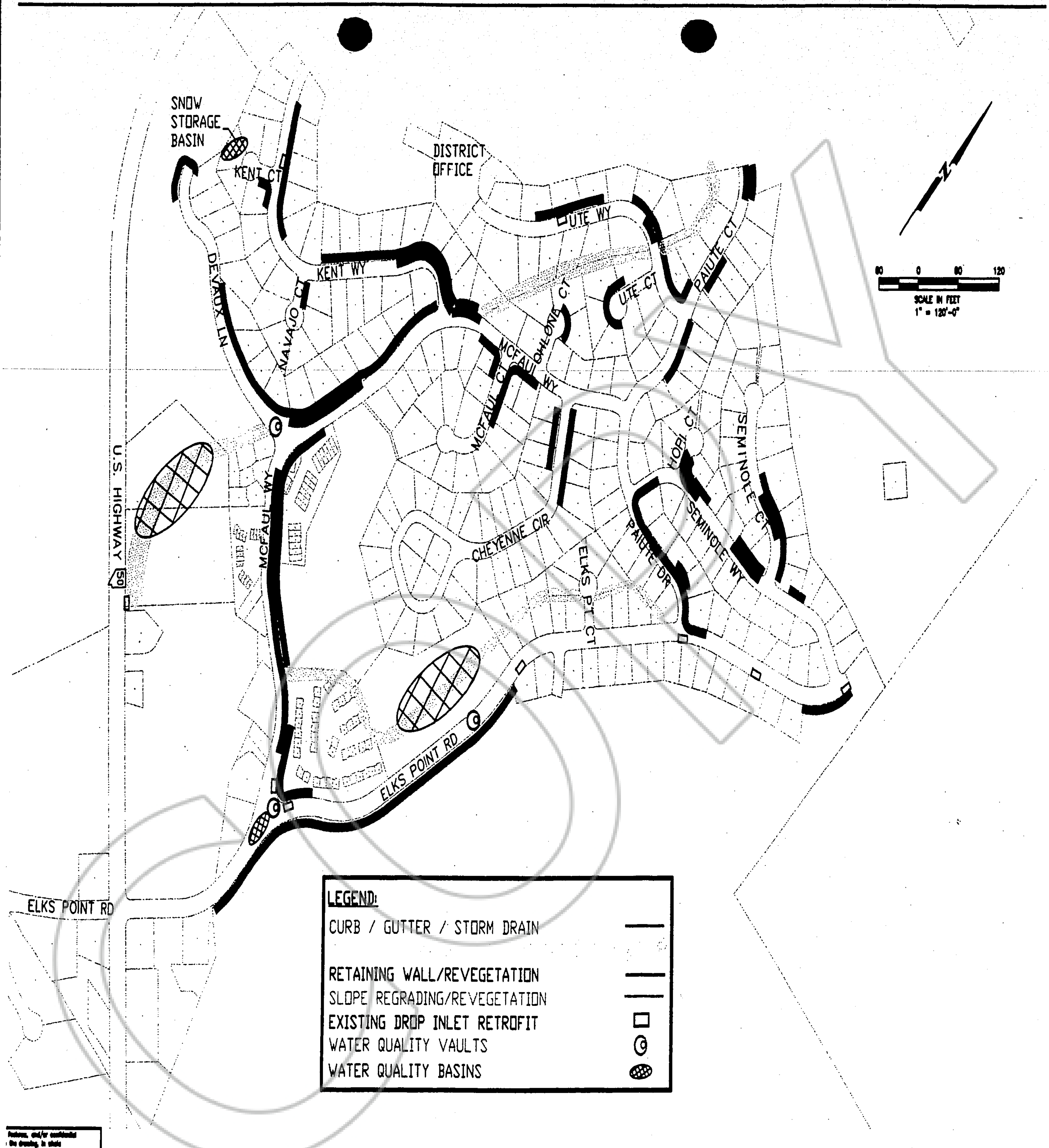

BY	CHK	DRAWN: GSB	PROJECT NO.:	FILE NAME:
		ENGINEER:	SCALE: 1"=200'	
		CHECKED: JNH	APPROVED:	
		DATE: 02/14/01	DATE:	

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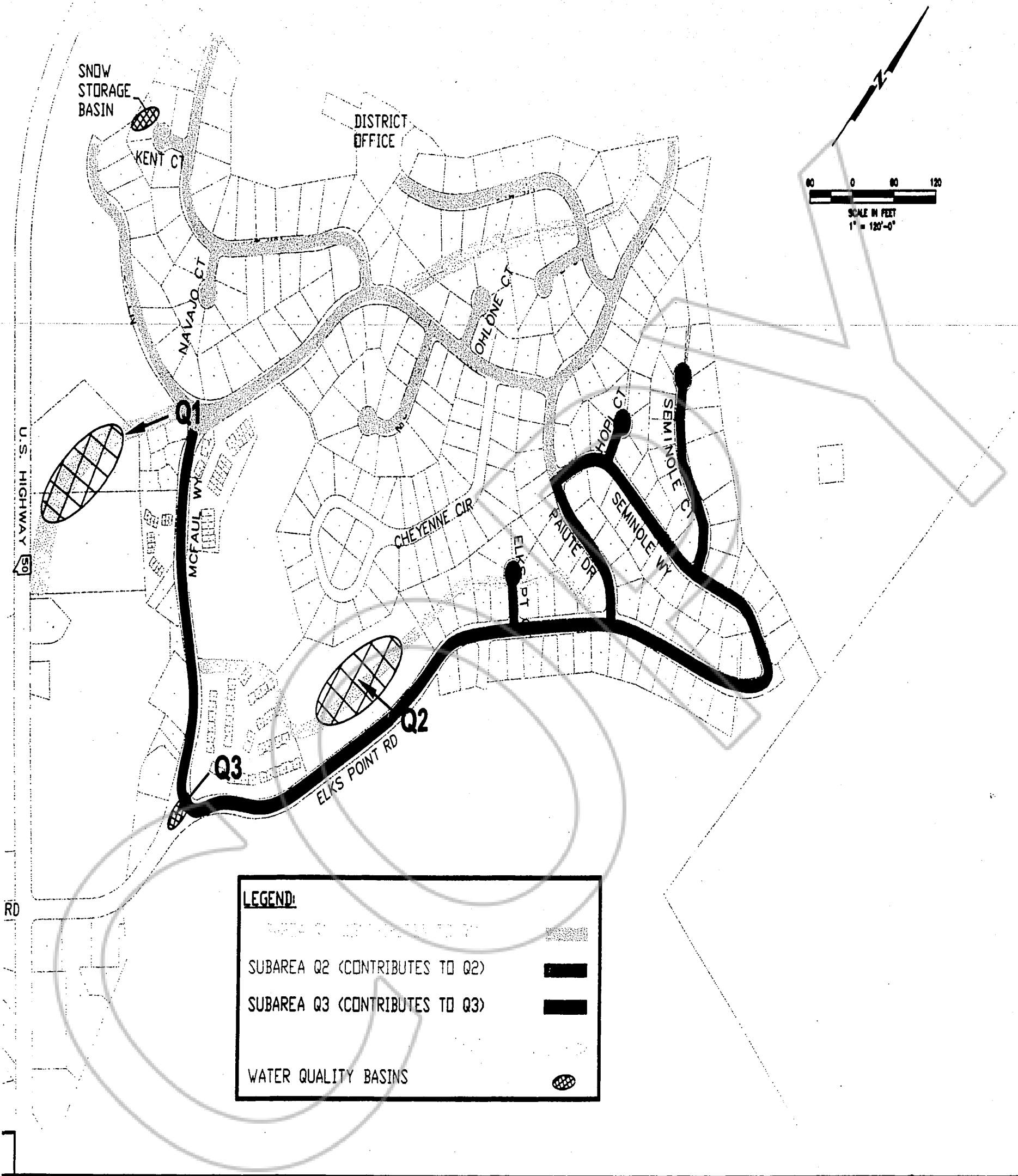
A MACTEC COMPANY
Engineering, Planning, Surveying, & Construction Services
1572 East College Parkway, Suite 162
Carson City, Nevada 89706

ROUND HILL G.I.D.
WATER QUALITY IMPROVEMENT PROJECT
ROUND HILL
GENERAL IMPROVEMENT DISTRICT

PROPOSED
IMPROVEMENTS MAP

DRAWING:
SHEET:
REVISION:
DATE:

0536792 BK0302PG04054



DRAWN: GSB	PROJECT NO.:	FILE NAME: drb.dwg	Harding ESE A MACTEC Company Engineering, Planning, Surveying, & Construction Services 1572 East College Parkway, Suite 162 Carson City, Nevada 89706 (775) 888-8982	ROUND HILL G.I.D. WATER QUALITY IMPROVEMENT PROJECT ROUND HILL GENERAL IMPROVEMENT DISTRICT	DRAINAGE SUBAREAS	DRAWING:
ENGINEER:	SCALE: 1"=200'					SHEET: 1 OF 1
CHECKED: JWH	APPROVED:					REVISION NUMBER:
DATE: 02/14/01	DATE:					DATE:

EROSION IN SEZ WEST OF DEVAUX LANE AND MCFAUL WAY

EROSION IN SEZ WEST OF DEVAUX LANE AND MCFAUL WAY

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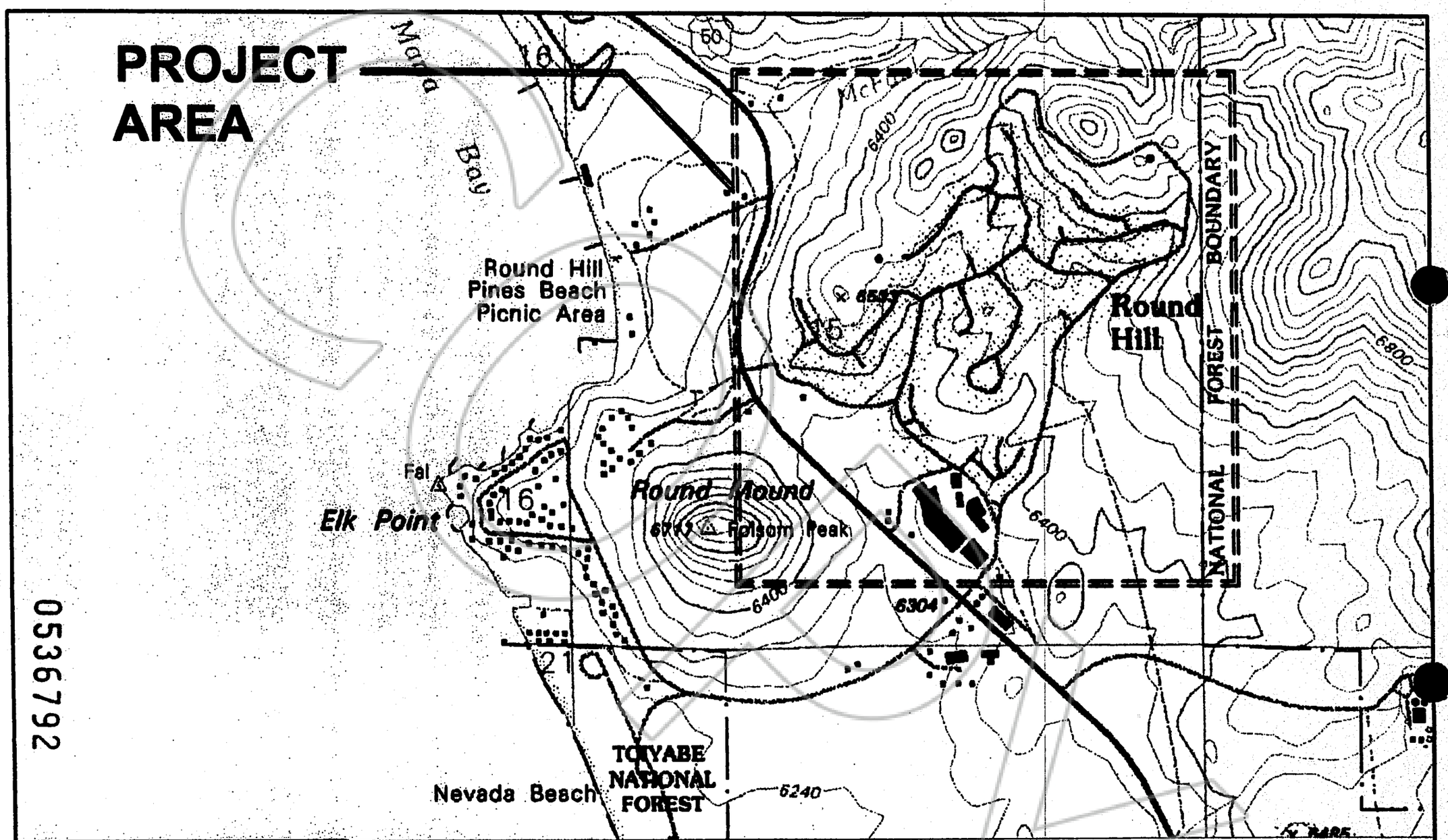
Engineering and Environmental Services

ROUND HILL GENERAL IMPROVEMENT DISTRICT
TAHOE BOND ACT PREAPPLICATION
PHOTOS DEPICTING EXISTING CONDITIONS
AUGUST – NOVEMBER 2000

FIGURE 1

DRAWN	JOB NUMBER	APPROVED	DATE
GSB	52059		14 FEB 01



05367792

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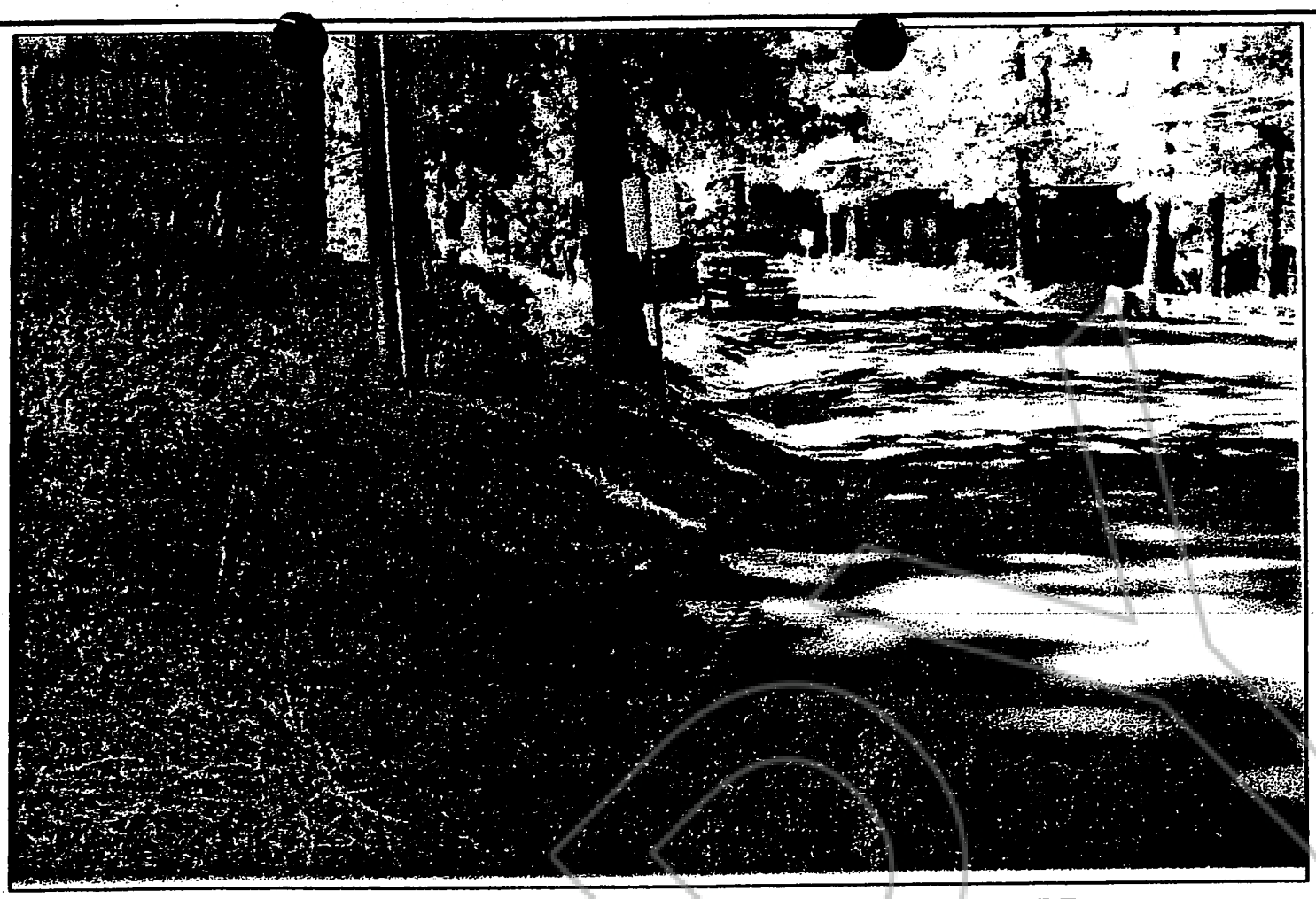

EROSION ON MCFAUL WAY. NO CURB, BARE SLOPE.

EXPOSED PIPE IN SEZ WEST OF DEVAUX LANE AND MCFAUL WAY

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Engineering and Environmental Services

ROUND HILL GENERAL IMPROVEMENT DISTRICT
TAHOE BOND ACT PREAPPLICATION
PHOTOS DEPICTING EXISTING CONDITIONS
AUGUST – NOVEMBER 2000

FIGURE 2

DRAWN	JOB NUMBER	APPROVED	DATE
GSB	52059		14 FEB 01

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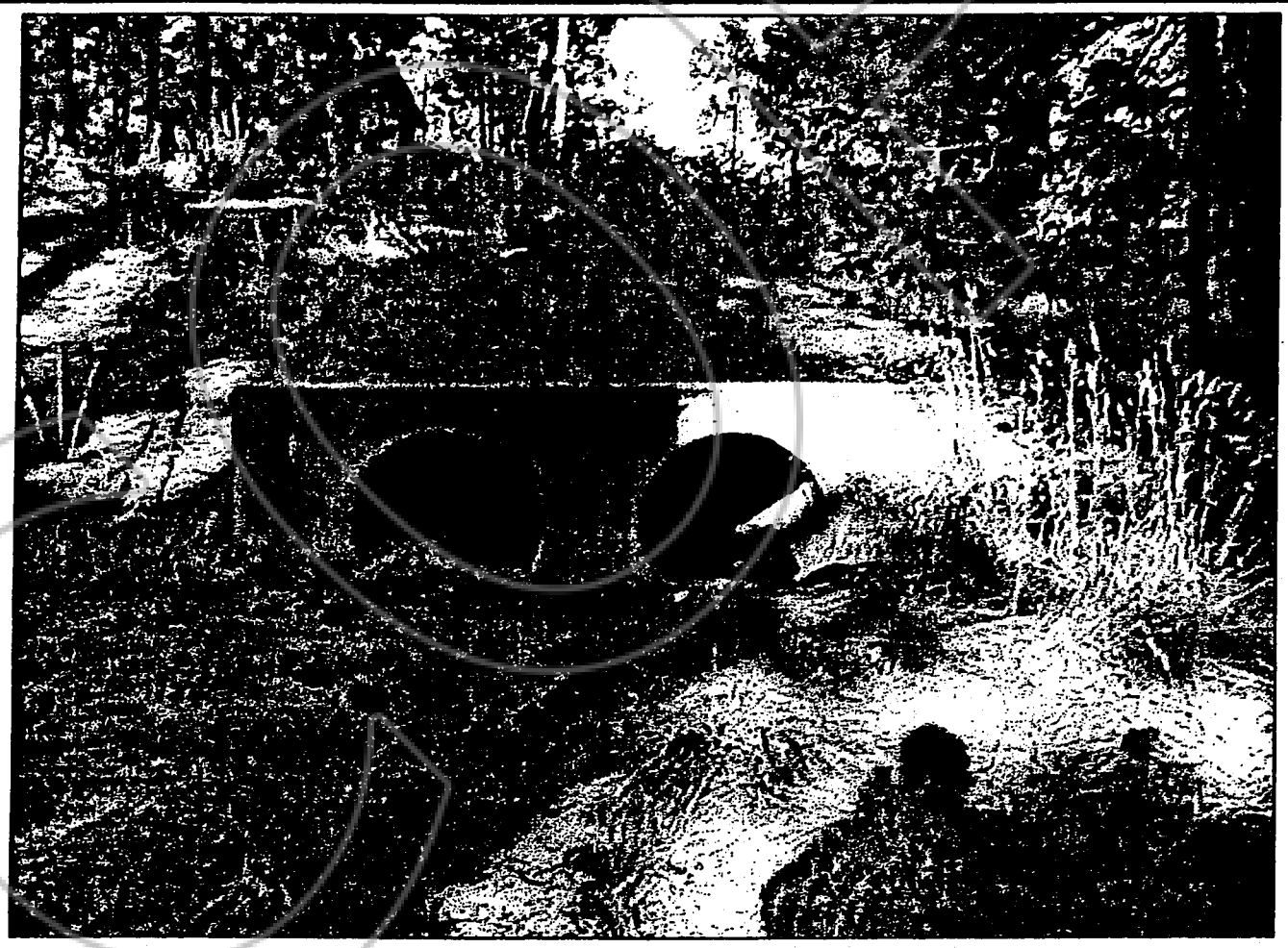
SEZ FROM UTE WAY TO MCFAUL WAY



CULVERT AT MCFAUL WAY

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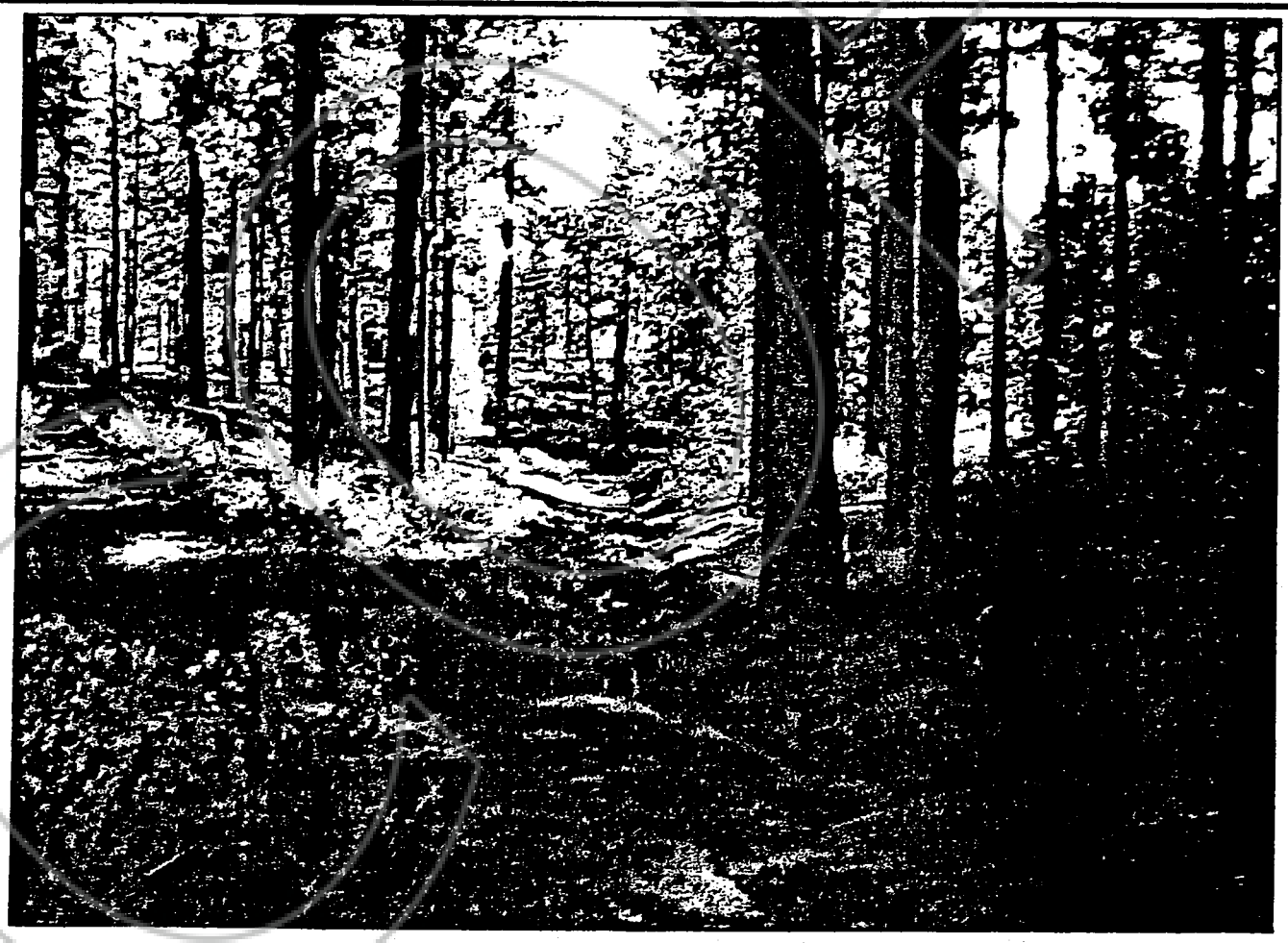
ROUND HILL GENERAL IMPROVEMENT DISTRICT
TAHOE BOND ACT PREAPPLICATION
PHOTOS DEPICTING EXISTING CONDITIONS
AUGUST – NOVEMBER 2000

FIGURE 3

DRAWN	JOB NUMBER	APPROVED	DATE
GSB	52059		14 FEB 01

SEZ NEAR ELKS POINT ROAD



SEZ NEAR ELKS POINT ROAD

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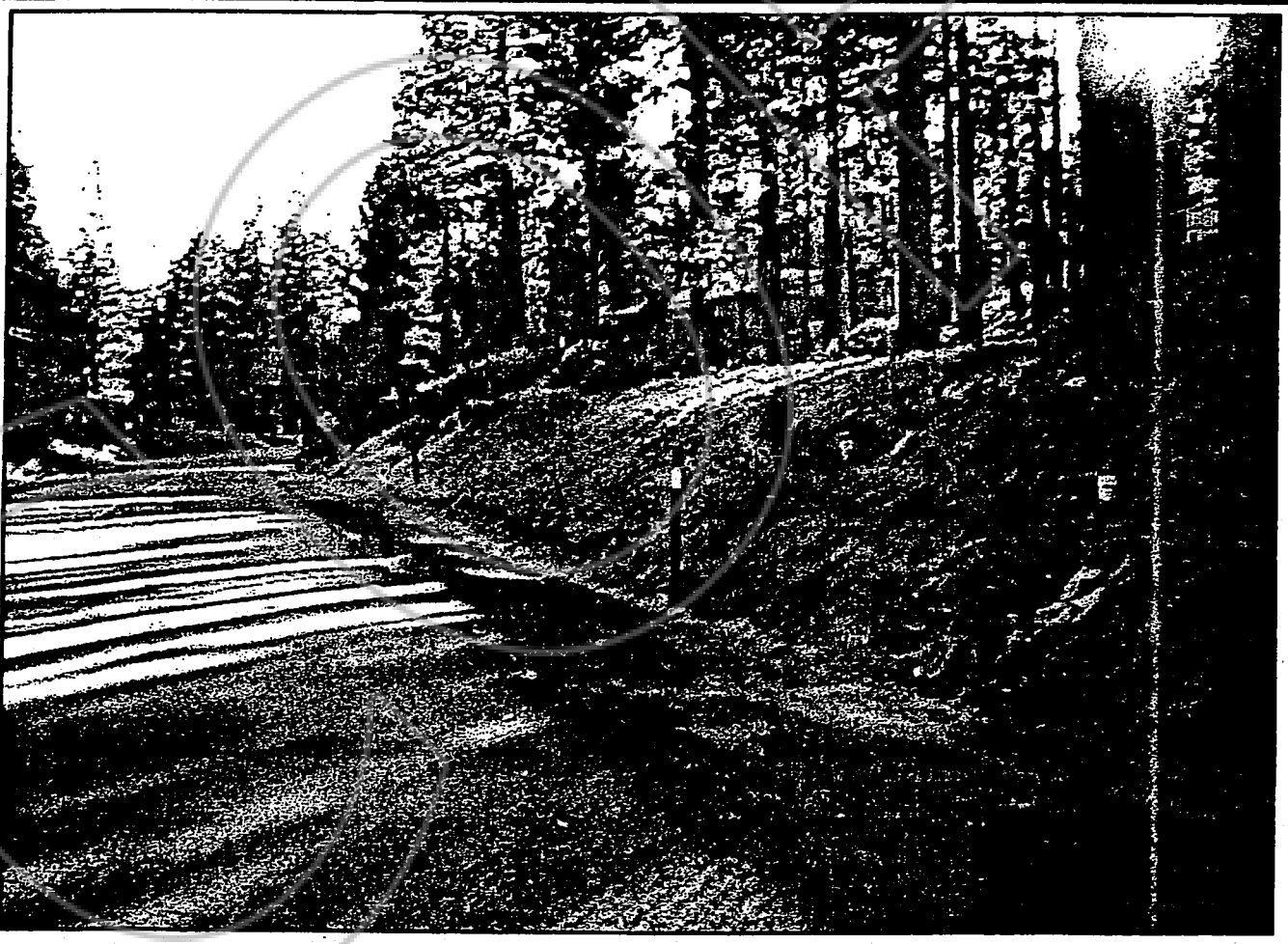
TAHOE BOND ACT PREAPPLICATION
PHOTOS DEPICTING EXISTING CONDITIONS
AUGUST – NOVEMBER 2000

FIGURE
4

DRAWN	JOB NUMBER	APPROVED	DATE
GSB	52059		14 FEB 01

SLOPE ON PAIUTE WAY



SLOPE ON MCFAUL WAY

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PHOTOS DEPICTING EXISTING CONDITIONS
AUGUST – NOVEMBER 2000

FIGURE 5

DRAWN	JOB NUMBER	APPROVED	DATE
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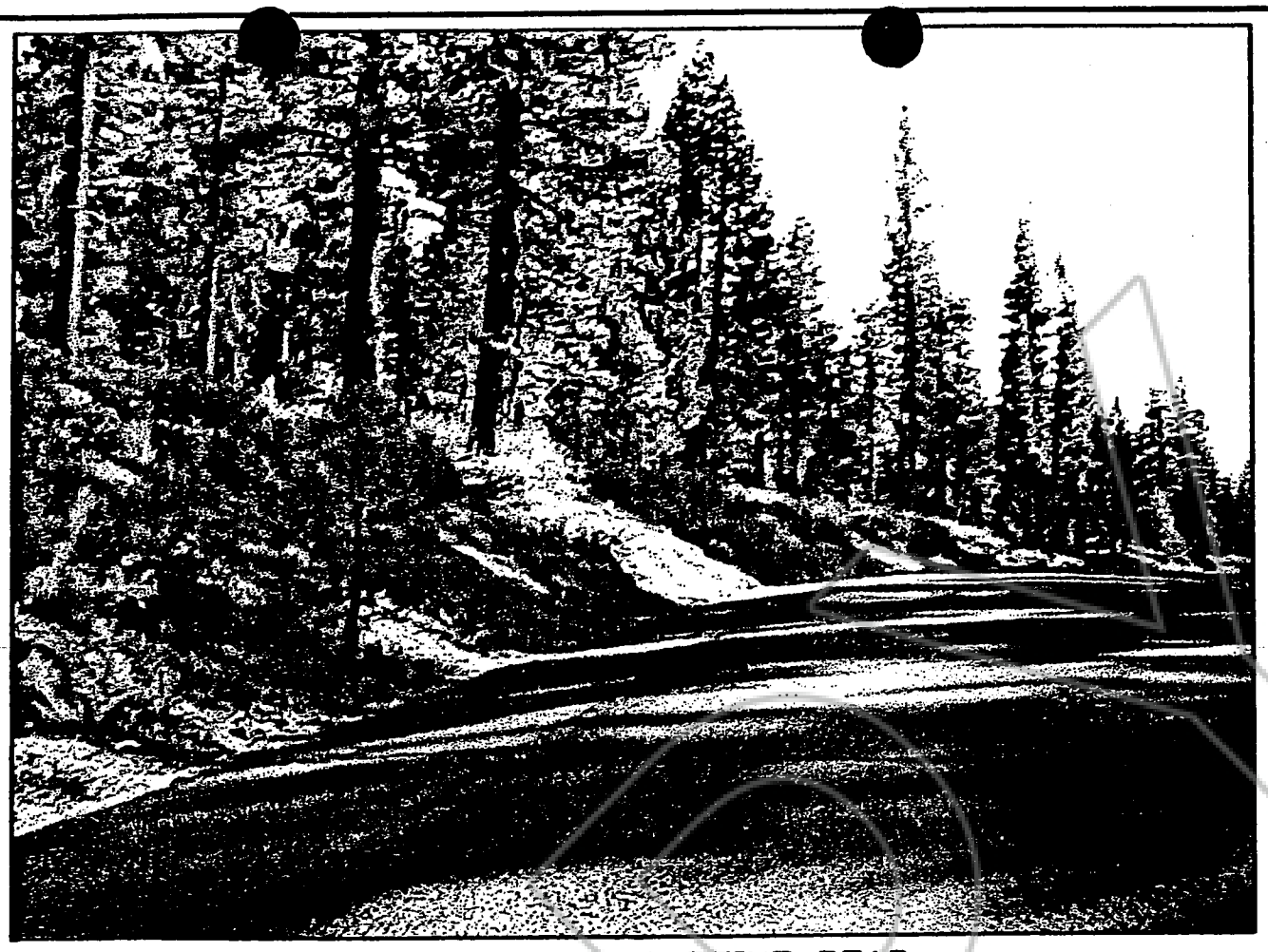
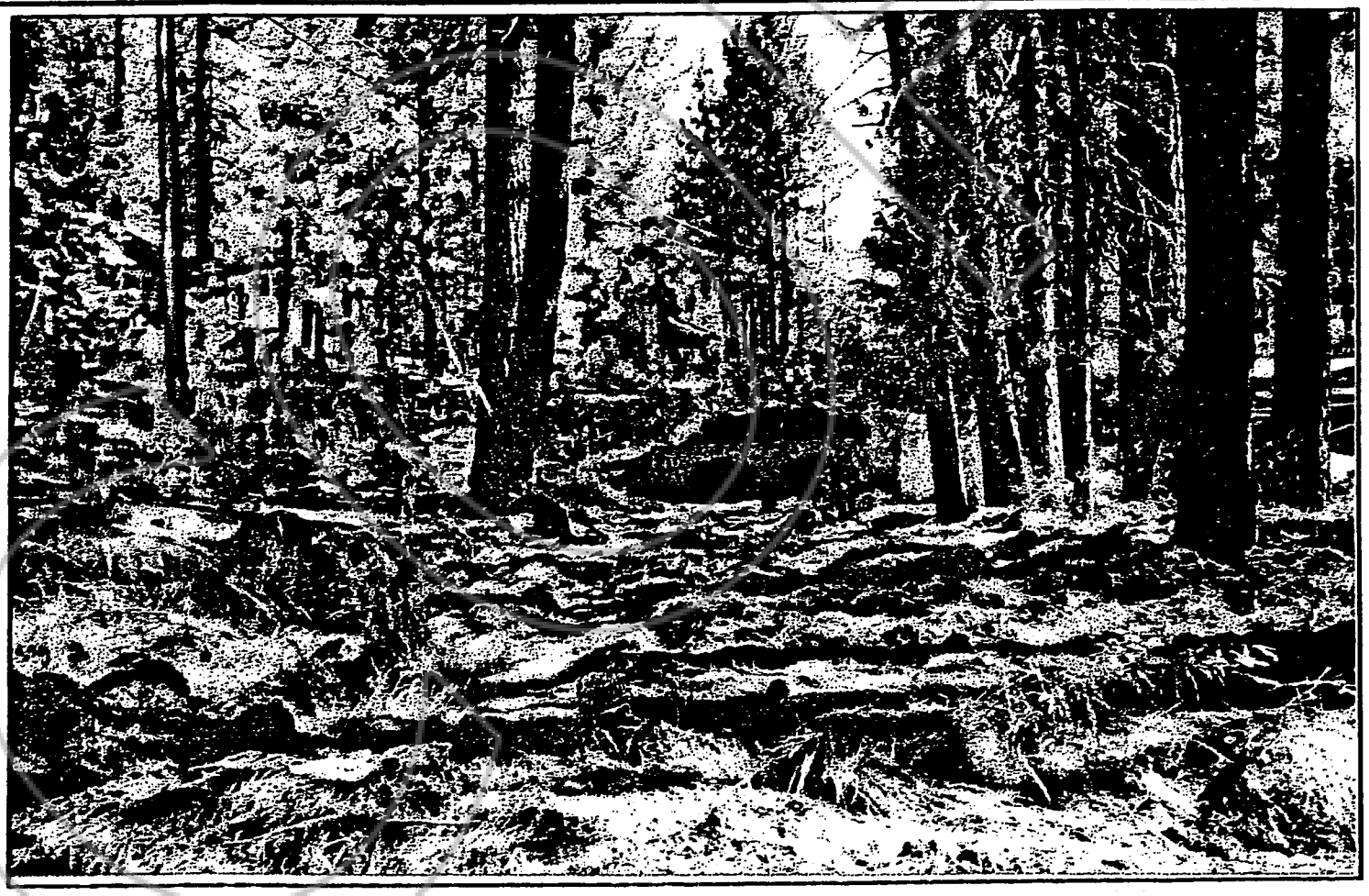


SLOPE ON ELKS POINT ROAD



CULVERT ON MCFAUL WAY

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ROUND HILL GENERAL IMPROVEMENT DISTRICT
TAHOE BOND ACT PREAPPLICATION
PHOTOS DEPICTING EXISTING CONDITIONS
AUGUST – NOVEMBER 2000

FIGURE 6

DRAWN	JOB NUMBER	APPROVED	DATE
GSB	52059		14 FEB 01

0536792
BK0302PG04062

TIME OF CONCENTRATION AND TRAVEL TIME Version 2.00

Project : ROUND HILL WQP User: LH Date:
County : DOUGLAS COUNTY State: NV Checked: ____ Date: _____
Subtitle: DRAINAGE CALC'S FOR SUBAREA - Q1

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.2	20	.01	A					0.007
Sheet		180	.01	H					0.756
Shallow Concent'd		600	.22	U					0.022
Open Channel		1800	.22		.0251		1.41		0.022
						Time of Concentration =			0.81*
									=====

--- Sheet Flow Surface Codes ---

A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense
J Range, Natural

--- Shallow Concentrated --- Surface Codes ---

P Paved
U Unpaved

* - Generated for use by GRAPHIC method

GRAPHICAL PEAK DISCHARGE METHOD Version 2.00

roject : ROUND HILL WQP User: LH Date:
ounty : DOUGLAS COUNTY State: NV Checked: ____ Date: _____
ubtitle: DRAINAGE CALC'S FOR SUBAREA - Q1

Data: Drainage Area : 1.2 Acres
Runoff Curve Number : 98
Time of Concentration: 0.81 * Hours
Rainfall Type : II
Pond and Swamp Area : NONE

Storm Number	1
Frequency (yrs)	10
24-Hr Rainfall (in)	3.2
Ia/P Ratio	0.01
Used	0.10
Runoff (in)	2.97
Unit Peak Discharge (cfs/acre/in)	0.634
Pond and Swamp Factor 0.0% Ponds Used	1.00
Peak Discharge (cfs)	2

- Value(s) provided from TR-55 system routines

TIME OF CONCENTRATION AND TRAVEL TIME Version 2.00

Project : ROUND HILL WQP User: DLH Date:
County : DOUGLAS COUNTY State: NV Checked: ____ Date: _____
Subtitle: DRAINAGE CALC'S FOR SUBAREA - Q2

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.2	20	.01	A					0.007
Sheet		180	.01	H					0.756
Shallow Concent'd		300	.20	U					0.012
Open Channel		1000	.20		.0251		1.41		0.013
						Time of Concentration =			0.79*
									=====

--- Sheet Flow Surface Codes ---

A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense
J Range, Natural

--- Shallow Concentrated --- Surface Codes ---

P Paved
U Unpaved

* - Generated for use by GRAPHIC method

GRAPHICAL PEAK DISCHARGE METHOD Version 2.00

roject : ROUND HILL WQP User: LH Date:
ounty : DOUGLAS COUNTY State: NV Checked: ____ Date: _____
ubtitle: DRAINAGE CALC'S FOR SUBAREA - Q2

Data: Drainage Area : .69 Acres
Runoff Curve Number : 98
Time of Concentration: 0.79 * Hours
Rainfall Type : II
Pond and Swamp Area : NONE

Storm Number	1
Frequency (yrs)	10
24-Hr Rainfall (in)	3.2
Ia/P Ratio	0.01
Used	0.10
Runoff (in)	2.97
Unit Peak Discharge (cfs/acre/in)	0.643
Pond and Swamp Factor 0.0% Ponds Used	1.00
Peak Discharge (cfs)	1

- Value(s) provided from TR-55 system routines

TIME OF CONCENTRATION AND TRAVEL TIME Version 2.00

Project : ROUND HILL WQP User: LH Date:
County : DOUGLAS COUNTY State: NV Checked: ____ Date: _____
Subtitle: DRAINAGE CALC'S FOR SUBAREA - Q3

Flow Type	2 year rain	Length (ft)	Slope (ft/ft)	Surface code	n	Area (sq/ft)	Wp (ft)	Velocity (ft/sec)	Time (hr)
Sheet	3.2	20	.01	A					0.007
Sheet		180	.01	H					0.756
Shallow Concent'd		200	.14	U					0.009
Open Channel		300	.14		.0251		1.41		0.005
						Time of Concentration =			0.78*

--- Sheet Flow Surface Codes ---

A Smooth Surface
B Fallow (No Res.)
C Cultivated < 20 % Res.
D Cultivated > 20 % Res.
E Grass-Range, Short
F Grass, Dense
G Grass, Burmuda
H Woods, Light
I Woods, Dense
J Range, Natural

--- Shallow Concentrated --- --- Surface Codes ---

P Paved
U Unpaved

* - Generated for use by GRAPHIC method

GRAPHICAL PEAK DISCHARGE METHOD Version 2.00

roject : ROUND HILL WQP User: LH Date:
ounty : DOUGLAS COUNTY State: NV Checked: ____ Date: _____
ubtitle: DRAINAGE CALC'S FOR SUBAREA - Q3

Data: Drainage Area : .32 Acres
Runoff Curve Number : 98
Time of Concentration: 0.78 * Hours
Rainfall Type : II
Pond and Swamp Area : NONE

Storm Number	1
Frequency (yrs)	10
24-Hr Rainfall (in)	3.2
Ia/P Ratio	0.01
Used	0.10
Runoff (in)	2.97
Unit Peak Discharge (cfs/acre/in)	0.648
Pond and Swamp Factor 0.0% Ponds Used	1.00
Peak Discharge (cfs)	1

- Value(s) provided from TR-55 system routines

ASSURANCES

The applicant hereby assures and certifies that he will comply with the regulations, policies, guidelines and requirements of the Division of State Lands (the "Division") and the Nevada Tahoe Conservation District (the "District"). Also, the applicant gives assurance and certifies with respect to the grant that:

A. It possesses legal authority to apply for the grant, and to finance and construct the proposed facilities; that a resolution, motion statute authority or similar action has been duly adopted or passed as an official act of the applicant's governing body, authorizing the filing of the application, including all understandings and assurances contained therein, and directing and authorizing the person identified as the official representative of the applicant to act in connection with the application and to provide such additional information as may be required.

B. It will have sufficient funds available to meet the non-Bond Act share of the costs.

C. Sufficient funds will be available when construction is completed to assure effective operation and maintenance of the facility for the purposes constructed.

D. It will hold the Division and the District free and harmless for any claims or liabilities resulting during construction of or during the life the erosion control facilities.

E. It will provide and maintain competent and adequate engineering supervision and inspection at the construction site to insure that completed work conforms with the approved plans and specifications; that it will furnish progress reports and such other information as the grantor agency may require.

F. It will operate and maintain the work done in accordance with the minimum standards as may be required or prescribed by the applicable state and local agencies.

G. It will give the grantor agency's authorized representative access to and the right to examine all records, books, papers, or documents related to the grant.

H. It will cause work on the project to be commenced within a reasonable time after receipt of notification from the approving state agency that funds have been approved and that the project will be prosecuted to completion with reasonable diligence.

I. It will not dispose of or encumber its title or other interests in the site and facilities for 20 years without state approval.

J. It will comply with Title IV of the Civil Rights Act of 1964 (P. O. 88-352).

K. It will establish safeguards to prohibit employees from using their positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties.

L. It will comply with the provisions of the Hatch Act which limit the political activity of employees.

Name Cameron McKay - RHGID

Signature _____ Date: 2-15-01

0536792

BK0302PG04069

Summary Ranking Checklist

Please rank your project using the following criteria:

1. **Soil erosion, pounds per dollar**

Range	Score
Over 25	**5**
20 to 24.9	**4**
15 to 19.9	**3**
10 to 14.9	**2**
5 to 9.9	**1**
0 to 4.9	**0**

Project score 1

2. **Runoff Treatment, cubic feet per dollar**

Range	Score
Over 5.0	**4**
2.5 to 5.0	**3**
1.5 to 2.49	**2**
0.5 to 1.49	**1**
0 to 0.49	**0**

Project score 1

3. **Condition of Watershed (see Table A-1)**

Priority	Score
1	**12**
2	**9**
3	**6**
4	**3**
5	**0**

Project score 9

4. **Distance from SEZ or Tributary to project's watershed**

Distance, miles	Score
0 to 0.25	**5**
0.26 to 0.5	**4**
0.51 to 0.75	**3**
0.76 to 1.0	**2**
Over 1.0	**1**

Project score 4

5. **Distance from the project to the Lake**

Distance, miles	Score
0 to 0.5	**6**
0.51 to 1.0	**5**
1.01 to 1.5	**4**
1.51 to 2.0	**3**
2.01 to 2.5	**2**
Over 2.5	**1**

Project score 6

6. Does the Project accomplish water quality goals on a sustained basis?

Yes	3
No	0

Project score 3

7. What is the Project matching funds level?

Matching Funds, %	Score
Over 45	**3**
35 to 44.9	**2**
25 to 34.9	**1**
25	**0**

Project score 1

Total Project Score 25

Tahoe Bond Act 2001-023 Logan Creek

<u>Exhibit B.</u> Tahoe Bond Act regulations – LCB File #R-222-97

3. Within 15 days after a proposal is forwarded, the director shall submit a copy of the proposal to each commissioner and, as directed by the chairman of the commission, arrange for an oral presentation before the commission by the person submitting the proposal.

4. The commission will do one of the following:

(a) Reject the proposal.

(b) Select a proposal for further consideration.

(c) Accept a proposal pursuant to any terms and conditions the commission considers appropriate.

(Added to NAC by Colorado River Comm'n, eff. 7-28-86; A by R219-99, 5-16-2000)

CONTROL OF EROSION AND RESTORATION OF NATURAL WATERCOURSES FOR LAKE TAHOE

NAC 321.300 Definitions. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) As used in NAC 321.300 to 321.365, inclusive, the words and terms defined in NAC 321.305 to 321.330, inclusive, have the meanings ascribed to them in those sections.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.305 "Committee" defined. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) "Committee" means the technical advisory committee established pursuant to section 7 of the "Cooperative Agreement" entered into by the division and the district on September 25, 1997.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.310 "District" defined. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) "District" means the Nevada-Tahoe Conservation District.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.315 "Division" defined. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) "Division" means the division of state lands of the department of conservation and natural resources.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.320 "Eligible county" defined. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) "Eligible county" includes only:

1. Carson City;
2. Douglas County; and
3. Washoe County.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.325 "Matching contribution" defined. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) "Matching contribution" means money or anything of value, including, without limitation, the use of personnel, materials or equipment of the applicant.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.330 "Project" defined. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) "Project" means a project for the control of erosion or the restoration of natural watercourses in the Lake Tahoe Basin.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.335 "Cooperative Agreement" adopted by reference. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995)

1. The "Cooperative Agreement" entered into by the division and the district on September 25, 1997, is hereby adopted by reference.

2. A copy of the "Cooperative Agreement" may be obtained without charge:

(a) In person, from the Division of State Lands, 333 West Nye Lane, Suite 118, Carson City, Nevada.

(b) By telephone, at (775) 687-4363 or (775) 687-4735.

(c) By mail, from the State Land Registrar, Division of State Lands, Capitol Complex, Carson

City, Nevada 89710.
(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000)

NAC 321.340 Grants of money: Award; distribution; matching contributions. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995)

1. The state land registrar will award grants of money from the sale of general obligation bonds of this state issued pursuant to section 1 of chapter 361, Statutes of Nevada 1995, to the department of transportation and eligible counties pursuant to NAC 321.340 to 321.365, inclusive.

2. Such money must be distributed as follows:

(a) Not more than one-third of the money may be allocated to projects of the department of transportation.

(b) At least two-thirds of the money must be allocated to projects of eligible counties.

3. An applicant for a grant pursuant to NAC 321.340 to 321.365, inclusive, shall provide a matching contribution to the project of not less than 25 percent of the total projected cost of the project for which the grant is being requested by the applicant.

4. The state land registrar will not award a grant pursuant to NAC 321.340 to 321.365, inclusive, in an amount which exceeds 75 percent of the projected cost of the project.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000)

NAC 321.345 Solicitation of applications; contents of application. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995)

1. The state land registrar will periodically solicit applications from eligible counties and the department of transportation for grants of money from the sale of general obligation bonds issued pursuant to section 1 of chapter 361, Statutes of Nevada 1995, and establish deadlines for the submission of those applications.

2. An application for such a grant must be submitted to the district and include, without limitation:

(a) A completed application on a form provided by the district;

(b) The amount of money requested for the project;

(c) The total projected cost of the project;

(d) A detailed description of the project;

(e) Proof of any title to land, lease or easement that is required for the carrying out of the project;

(f) A map of the location of the project;

(g) A statement regarding the conformity of the project to all applicable local and regional land use plans;

(h) A plan for the operation and maintenance of the project for a period of not less than 20 years, including, without limitation, the identity of the person who will operate the project and provide the maintenance; and

(i) An itemized list of the costs of the project in accordance with the descriptions of work and unit prices set forth in the "Question 12 Project Cost Estimator" which is hereby adopted by reference. A copy of the "Question 12 Project Cost Estimator" may be obtained without charge:

(1) In person, at the United States Department of Agriculture, Natural Resources Conservation Service Tahoe Field Office, 870 Emerald Bay Road, Suite 108, South Lake Tahoe, California.

(2) By telephone, at (530) 573-2761.

(3) By mail, at the United States Department of Agriculture, Natural Resources Conservation Service Field Office, P.O. Box 10529, South Lake Tahoe, California 96158.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000)

NAC 321.350 Evaluation and prioritization of projects. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) The district shall:

1. Evaluate the feasibility of each project and its estimated costs and benefits pursuant to the criteria set forth in NAC 321.355. In its review of each project, the district shall use the technical advice of the committee.

2. Develop a preliminary list which ranks projects for which applications have been submitted in order of priority for each of the following categories:

(a) Projects of the department of transportation.

(b) Projects of eligible counties for the control of erosion.

(c) Projects of eligible counties for the restoration of natural watercourses.

3. Make the preliminary list of prioritized projects available for public review.

4. Conduct at least one public hearing regarding each preliminary list of prioritized projects. The district may revise each preliminary list after the public hearing.

5. Submit a final list of prioritized projects for each category of projects to the state land registrar with a written evaluation of each project which addresses the criteria set forth in NAC 321.355.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.355 Criteria for evaluating projects for award of grants. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) The district shall evaluate each project pursuant to the following criteria:

1. The benefit to the water quality of Lake Tahoe, including, without limitation, whether the project:

(a) Will address a significant problem relating to soil erosion or water quality or both soil erosion and water quality;

(b) Will result in a quantifiable improvement in water quality;

(c) Is listed as a priority project in the "Water Quality Management Plan for the Lake Tahoe Region" or the "Environmental Improvement Program" of the Tahoe Regional Planning Agency; and

(d) Will reduce significantly the amount of untreated runoff that is currently being deposited in Lake Tahoe.

2. The adequacy of the design of the project, including, without limitation, whether the proposed project:

(a) Uses proven, effective and cost effective techniques to address the control of soil erosion and untreated runoff;

(b) Restores and preserves vegetation and stream environmental zones to the maximum extent possible;

(c) Uses improvements that reflect aesthetic considerations; and

(d) Uses bioengineering.

3. The comprehensive approach of the project, including, without limitation, whether all identifiable aspects of the problem of soil erosion in the project area or the watershed are covered in the project.

4. The long-term viability of the project.

5. The cost effectiveness of the project, including, without limitation, the potential of the project to attract financing in addition to the grant.

6. The ability of the applicant to carry out the project in a timely manner.

7. The ability of the portion of the project that will be paid for with money from the grant to achieve benefits to water quality independently of the other components of the project.

8. The ability of the project to be used as a model for future projects, including, without limitation, whether the project:

(a) Uses biotechnology; and

(b) Combines proven and innovative approaches.

9. The amount of cooperation and support for the project from persons other than the applicant, including, without limitation:

(a) Federal, state and local governmental agencies; and

(b) Private landowners.

10. The amount of a matching contribution to the project that will be provided by the applicant which must equal at least 25 percent of the cost of the project.

11. The adequacy of the plan for maintenance of the project.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

NAC 321.360 Agreement between state land registrar and recipient of grant. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995) The state land registrar and the recipient of a grant shall enter into an agreement, which must require that the recipient shall:

1. Provide a matching contribution to the proposed project of not less than 25 percent of the cost of the project;

2. Operate and provide maintenance for the project for not less than 20 years after the project is completed; and

3. Obtain such easements for conservation as are necessary to carry out the project. The easements must be appr[redacted]d by the state land registrar. As use[redacted] this subsection, "easement for conservation" has the mea[redacted]ng ascribed to it in NRS 111.410.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98; A by R022-00, 5-4-2000)

NAC 321.365 Acceptable and unacceptable uses of grant. (NRS 548.360 and sec. 2 of ch. 361, Stats. of Nevada 1995)

1. Except as otherwise provided in subsection 2, the recipient of a grant pursuant to NAC 321.340 to 321.365, inclusive, may use the money from the grant to pay for:

(a) All expenses related directly to the project, including, without limitation, expenses related to the design and construction of the project; and

(b) The administrative costs of the project, not to exceed 3 percent of the total cost of the project.

2. The recipient of a grant pursuant to NAC 321.340 to 321.365, inclusive, may not use the money from the grant to pay for:

(a) Any planning activities which are not directly related to the design and engineering of the project;

(b) The purchase of new equipment;

(c) The paving of curbs or gutters, unless the paving of curbs or gutters is recommended by the committee to remedy erosion;

(d) The acquisition of land, unless such an acquisition is deemed by the state land registrar to be an integral component of the project;

(e) Any work required by a public agency as mitigation or as a condition of the approval of any other project; and

(f) Any component of the project that is deemed by the state land registrar to not benefit the public.

(Added to NAC by St. Land Registrar by R222-97, eff. 3-5-98)

Tahoe Bond Act 2001-023 Logan Creek

<u>Exhibit C.</u> Objectives and Guidelines for Revegetation Success under the Nevada Tahoe Bond Act.

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Objectives and Guidelines for Revegetation Success Under the Nevada Tahoe Bond Act

May 14, 1999

Prepared by: Michael Hogan

For the Nevada Tahoe Bond Act Technical Advisory Committee

Objectives and Guidelines for Revegetation Success Under The Nevada Tahoe Bond Act

May 14, 1999

Prepared by: Michael Hogan

For the Nevada Tahoe Bond Act Technical Advisory Committee

Introduction

These objectives and guidelines are set forth as suggestions for the planning and implementation of successful revegetation and restoration projects that are assisted through funding from the Nevada Tahoe Bond Act of 1996. While these objectives and guidelines are aimed specifically at uplands projects, all of the objectives and most of the guidelines can be applied to riparian projects and all but Objective Seven can be applied to wetlands projects. This document is not intended to provide a specific formula from which to write project specifications. It is intended as a map or outline from which site and project-specific specifications can be developed. The components of these guidelines, if incorporated into revegetation specifications, should provide a complete plan capable of producing a project that can support a sustainable plant community, thereby reducing the risk of erosion as much as possible.

- **Objective One: Plan Preparation Should Include a Qualified Restoration Specialist[i] or Team**

  - Guideline 1A: Plans and specifications for a revegetation project should be developed by a revegetation specialist (or team of specialists) that is (are) capable of producing a complete revegetation and erosion control package that reflects the Objectives and Guidelines presented in this document.

  - Guideline 1B: Initial Planning Approach: The revegetation specialist or revegetation team should be included in the planning process from plan inception. Revegetation planners should work closely with the project engineers through the entire planning process in order to assure that the engineering and biological components of the projects are completely integrated. These guidelines suggest that in some instances, the engineering components of the project will support the vegetative component and therefore, the vegetation specialist would be part of the primary design team.

  - Guideline 1C: The revegetation specialist or primary member of the revegetation team should function as the revegetation inspector during project implementation.[ii]

- **Objective Two: The initial and potential project outcome should be clearly defined**

  - Guideline 2A: The outcome of the project should be envisioned and defined for at least two points in time:

    - at project completion

    - at some future time, ideally 3 to 5 years following project completion

  - Guideline 2B: When defining the project outcome, components such as physical appearance and physical and biological functioning should be carefully considered.

- **Objective Three: Site specificity is a critical planning consideration.**

  - Guideline 3: Each project must be considered as an individual and unique situation in both time and space. As the revegetation/erosion control plan is being developed, these unique aspects should be taken into consideration and dealt with accordingly. Although many of the individual components are covered in subsequent sections of these guidelines, these specific components would include at least:

    - Topography and related physical parameters
    - Geology, subsurface materials and parent material type
    - Soil parameters
      - *Nutrient and organic matter content*
      - *Texture, structure, water holding capacity and infiltration capacity*
      - *Compaction*
      - *Toxicity or contaminants*
    - Existing plant community and surrounding plant community
    - Actual and potential uses of the site and surrounding areas.

- **Objective Four: Topographical and geological features should be considered for each project.**

  - Guideline 4: Physical features must be considered and where appropriate, they must be ameliorated and /or planned for. These features include:

    - Existence of native topsoil[iii]
    - Slope angle or steepness

- ♦ Consolidation or stability of existing soil surface
- ♦ Outcropping of parent material or other rock surfaces
- ♦ Drainage patterns on site
- ♦ Drainage from off-site sources onto the project site
- ♦ Elevation
- ♦ Aspect

- These topics are discussed in greater detail in the endnotes.[iv]

▪ Objective Five: Determine the soil properties[v]

- Guideline 5A: Pre-project soil sampling: Soil samples must be taken from the project site and from an adjoining native or well-vegetated reference site where possible in order to establish nutrient needs and nutrient status.
  - ♦ 5A-1: Soil samples must be taken by a qualified and trained individual using an approved method.[vi]
  - ♦ 5a-2: Soil samples must be analyzed by a soils laboratory using appropriate methods.[vii]
- Guideline 5B: Soil amendment recommendations[viii] should be made based upon the soil samples and past research that has suggested appropriate levels of soil amendments required for successful revegetation. These recommendations must be made by a qualified individual. Further information can be obtained from the Nevada Tahoe Bond Act TAC or the Tahoe NRCS office (530) 541-1496.
- Guideline 5C: Soil Preparation: Soil must be prepared so that the soil profile is free from compaction to approximately 12 inches wherever possible. [ix]
- Guideline 5D: Application of soil amendments: soil amendments should be applied evenly over the soil surface and then incorporated into the top 0.5 to 2 inch layer, unless otherwise specified by the supplier. This can also be done by mechanical rake or hand methods (usually a hand rake).
- Guideline 5E: Finished Ground Surface Shape: the finish surface should be left in an irregular shape. [x]
- Guideline 5F: Minimize future disturbance wherever possible. [xi]

- 5F-1: Brush, logs, rocks and other natural materials can be placed strategically across the project to make traffic difficult or impossible. These materials can also add aesthetic appeal if place appropriately.

- 5F-2: In areas that have had high levels of recreational traffic, such as hikers, joggers or mountain bikers, a well defined trail can be created that will concentrate traffic. In that concentrated traffic area, appropriate BMPs can be implemented that can reduce erosion.

- **Objective Six: Use native plant materials whenever possible**[xii]

  - Guideline 6A: Native plant material should be used whenever possible. The plant list should be designed so that the *target* plant community reflects an appropriate local native plant community. The planted material should contain a mix of early colonizers, intermediate seral species and target 'climax' community members. [xiii]

  - Guideline 6B: Seed or cuttings should be taken at the appropriate time and should be collected from as close to the project site as possible. [xiv] Plant material that is to be used for seedlings/live plants may need to be collected well in advance of project construction, sometimes *as much as a year in advance*.

    - 6B-1: Non-local, commercially available native grass species may be appropriate as a foundation for the seed mix. [xv]

  - Guideline 6C: Seed or plant material collection should be supervised by a person knowledgeable about local native plant material collection.

  - Guideline 6D: A combination of seedlings and direct seeding should be used to provide the best combination of protection. [xvi]

  - Guideline 6E: Seedlings should be planted using an appropriate technique and a high-quality slow-release nutrient source. [xvii]

  - Guideline 6F: Plants should be planted at the appropriate time of year. The planting time should be specified in the planting plan. A contingency should be provided if the target planting window is not achieved. [xviii]

  - Guideline 6G: Environmental, ecological and physiological requirements of seed should be considered when preparing a seed planting specification. Typically, seeds may be raked into the soil surface to a depth of no more that 0.5 inches in order to keep seed material from moving off site. Planting specialists should be contacted for further information (see Comstock Seed and Western Botanical in 'Appendix One').

- **Objective Seven: A long lasting mulch material should be used.**

  - Guideline 7A: A native mulch such as pine needles or fir needles is preferred. [xix]

  - Guideline 7B: Certified weed free or native straw should be used for short-term stabilization only.[xx]

  - Guideline 7C: Wood chips may be used for temporary erosion control.[xxi]

  - Guideline 7D: Mulch material should be of a thickness that can both protect the soil surface and allow plant growth. The specific thickness of mulch cover will depend upon the type and consistency as well as the density of the mulch material. However, as a rule, most of the ground surface (>95%) should be covered. [xxii]

    - 7D-1: Pneumatic (mechanical blower) application is preferred over hand application of most mulch materials since pneumatic equipment allows better mulch-to-ground surface contact, thus providing superior erosion protection. However, hand application may be a practicable alternative in hard-to reach or very small areas.

  - Guideline 7E: Geotextile materials can be used as a covering over a native mulch material, but *should not be used as the primary mulch cover.*

    - 7E-1: Geotextiles should consist of biodegradable materials and should include no plastics or other so-called 'photo-degradable' materials.[xxiii]

    - 7E-2: Stapling of fabric should follow or exceed manufacturer suggestions. Care should be taken to allow complete contact between the fabric matrix and the soil surface. This is especially important on rocky surfaces.

  - Guideline 7F: An organic tackifier may be used on steeper slopes or in windy conditions or other situations where additional mulch stabilization is required.

- **Objective Eight: Maintenance Considerations**[xxiv]

  - Guideline 8A: Projects should be designed so that irrigation is not needed. However, if long-term drought threatens plant survival during the first two growing seasons, irrigation may be considered. However, irrigation should only be used to assist in plant establishment. [xxv]

- Guideline 8B: Plant replacement contingency should be included in case a significant portion of the planted seedlings die or are very unhealthy. [xxvi]

- **Objective Nine: Project monitoring should provide the project proponent with useful information.**

  - Guideline 8A: Short term monitoring should be designed to ascertain immediate conditions, short term survival and growth needs of the vegetation community. Soil movement should also be monitored. This information should feed back to the maintenance component.

  - Guideline 8B: Long-term monitoring should be anticipated.[xxvii]

Appendix One: Sources for Material and Information

The following list in no way implies preference or recommendation. However, all of the companies on this list have performed satisfactory work in the particular category in which they are listed. This list does not include all possible sources. Any persons or companies wishing to be included on future lists can contact the NRCS Office or Michael Hogan at IERS. For general questions also please contact the NRCS (530) 541-1496 or Michael Hogan (530) 525-1335.

Soil Testing:

- For information, contact NRCS Office.....(530) 541-1496
- Laboratory Analysis: Soil and Plant Lab; Laurie Littleford.....(408) 727-0330

Native plants

Collection:

- Comstock Seed Co.....(775) 746-3681

Nurseries:

- Cornflower Farms.....(916) 689-1015
- NDF Washoe Nursery.....(775) 849-0213

General/Info/Specs, etc.:

- Western Botanicals.....(775) 849-3223
- HLA; Jeanette Halderman .....(530) 550-9260
- California Native Plant Society, Tahoe Chapter.....(530) 525-4366

Seed

- Comstock Seed Co.....(775) 746-3681
- Pacific Coast Seed.....(925) 373-4417
- Conservaseed.....(916) 775-1646
- Hedgerow Farms.....(530) 662-4570

Compost

- Full Circle Compost.....(775) 782-5305
- Bentley Agrodynamics.....(775) 782-9309

Pine Needle Mulch

- South Shore: South Tahoe Refuse - Jeannie Lear.....(530) 541-0366
- Incline: Waste Not - Jessica Bayer.....(775) 831-8603
- Tahoe North/Truckee: ERL - Vince Nocito.....(530) 587-4235

▪ Appendix Two: Endnotes

[i] "Qualified" in this context in intended to mean: capable of producing a viable revegetation plan based upon these guidelines. A well-prepared plan that reflects the values and practices presented here will indicate to the plan review committee whether the individual or individuals are qualified.

[ii] The revegetation specialist will have the clearest idea of what the project should look like on the ground. Many projects are incorrectly implemented due to a simple misunderstanding between the project planners and the implementing personnel. If the revegetation specialist were utilized as a member of the inspection team, much of this potential misunderstanding would be circumvented.

[iii] If a native or developed topsoil material is present on site, accommodations should be made to remove, stockpile and re-apply this material to the final project. Reapplied topsoil is generally not sufficient to replace total nutrient needs for an entire project and so an additional nutrient source should also be considered, based upon the results of the soil tests.

[iv] The various subjects outlined in Guideline 4 include:

- Slope angle or steepness

The angle of the slope is generally a primary determiner of erosion potential. Often, oversteepened slopes require some sort of reworking to lower the angle.

- Consolidation or stability of existing soil surface

If the surface material is unconsolidated or otherwise unstable, greater erosion potential exists. If this is the case, a greater amount of effort may be required to stabilize the soil material.

- Outcropping of parent material or other rock surfaces

If parent material is close to the surface or is exposed, adequate rooting depth may not exist. This situation needs to be recognized and planned for.

- Drainage patterns on site

Surface and subsurface drainage patterns should be recognized and accounted for in the overall surface preparation plan.

- Drainage from off-site sources onto the project site

Drainage from off site sources can severely effect the soil stability of the project, causing rills, gullies, etc. This is an oft-overlooked component of project planning.

- Elevation

Different elevations are associated with different soil temperatures, precipitation levels and plant communities.

- Aspect

Aspect can have a great influence on solar input and therefore, evapotranspiration potential. This can have a large influence on the type of plants that will survive there.

[v] The soil is potentially the most important component of a revegetation project and process. If a soil does not contain adequate nutrients or if it is over-compacted or affected in some other way, plants will not be able to establish or maintain a foothold and will therefore not persist. Care must be taken to understand and ameliorate all sub-standard soil parameters.

[vi] Soil research conducted in the Lake Tahoe Basin has shown a correlation between certain nitrogen pools and successful revegetation efforts. Soils should be analyzed using the methodology outlined in this report so that the extensive data that has already been gathered can be used to define soil amendments that will be required on a specific project. This research is reported in Caltrans Report RTA53X461. This report should be available from John Haynes (916) 227-7109, The Tahoe NRCS Office (530) 541-1496 or the UC Davis Soils and Revegetation Group (530) 752-6514. The research and methodology have been developed by the UC Davis Soils and Revegetation Group. The research has been conducted and reported by Claassen and Hogan. As other research is conducted and evaluated, that research will be included as an additional evaluation method.

[vii] Soil samples can be analyzed by a qualified soil lab using specific testing methodology. This methodology is that which was used by Claassen and Hogan (Caltrans Report RTA53X461) in collecting data referenced previously. Using this methodology, meaningful analysis can be accomplished. The analysis protocol has been developed for wildland soils analysis and is additional to any agronomic tests that may be required. These tests will be available from Plant and Soil Laboratories, Laurie Littleford, (408) 727-0330. Other labs may be able to perform these tests. Inquiries should be made to the Nevada Tahoe Bond Act TAC or the Tahoe NRCS office (530) 541-1496.

[viii] Soil amendments should mimic the nutrient content and release characteristics of a native soil. Amendments will typically consist of stable compost and an appropriate slow release amendment or some other equivalent material that fulfills the requirements indicated in the soil tests.

[ix] Compaction can be ameliorated by mechanical means such as a tractor-operated sub-soil cultivator, a disc or other suitable method, or by hand, using a pick-mattock, pulaski or other hand tool. Soil does not need to be finely dispersed but must be in such a state that water can freely penetrate to a depth of at least 12 inches. Reducing compaction will reduce erosion by allowing infiltration into the soil profile. Additionally, compacted soils are less able to support a plant community due to the decrease in water holding capacity as well as the physical barrier to root penetration.

[x] Small surface irregularities can create pockets to trap or slow runoff. These irregularities can be created by a skillful equipment operator if careful explanation is provided. Irregularities can also be created by hand tools or even by carefully planned foot traffic. In some cases (probably not appropriate to the

Lake Tahoe Basin) cattle and sheep have been used to create micro-depressions and material incorporation. The overall idea is to reduce any continuous smooth surface so that surface flow velocity will be reduced.

[xi] Future potential traffic patterns across the project area should be identified and controlled. This includes intentional and random traffic by humans as well as animals. Canines, children at play and other pedestrians can have a large negative impact on the project area. Projects that have attempted to revegetate old roads or trails have been completely destroyed by continued, uncontrolled use after project completion.

[xii] Native plants offer several advantages over non-native materials. Native plants are well adapted to the local area, many native plants can often survive and possibly thrive with less water and nutrients than non-natives, and the use of natives, if collected locally, will not introduce weed seeds.

[xiii] The Tahoe Regional Planning Agency has developed an "Approved Plant List". The suggestions in these guidelines are more restrictive since we believe that native plants are preferable to non-native adapted species. However, much discussion is currently underway concerning plant material in general. If native plant material is not available, available, non-native material from the TRPA Approved Plant List may be used. Sources of native plants and native plant nurseries may be obtained from the Lake Tahoe Basin NRCS office at (530) 541-1496.

[xiv] Seed or cuttings should be taken from a range of plants and populations wherever possible in order to insure genetic diversity. As a general rule, material should be collected within 1500 ft in elevation and 50 linear miles distance from the project site. Plant material should not be collected from a different plant community type than the target community.

[xv] Species such as Elymus glaucus Stanislaus 5000 or Mokelumne Brome may be acceptable as a partial component of the seed mix but unless the project is an emergency stabilization project, these non-local materials should make up only a portion of the entire seed mix, not to exceed 25% except in unusual circumstances.

[xvi] Seedlings will provide initial and immediate soil protection and will provide a long-term seed bank/plant community source. Direct seeding provides a seed bank for longer-term plant establishment. The mix should consist of a combination of grass seed for quick, initial stabilization and forb and shrub seed for longer-term plant community establishment. It should be kept in mind that the use of native seed often requires a longer-term commitment to germination and growth of seeded material. Some species may not germinate for several years. This reality underscores the need for a stable, long-lasting mulch material.

[xvii] Some of that nutrient source should be placed in the bottom of the planting hole and separated from the root mass by a thin layer of soil. Some additional nutrient should be placed on the surface in a circular pattern outside the plants drip line. Specific amounts and placement will depend upon the size of the

seedling or plant. Planting holes should be flooded and allowed to drain down at least twice unless soil moisture is adequate to support the seedlings.

[xviii] There are varying professional opinions regarding the best time of year to plant. Generally, Fall is believed to be the ideal time to plant if natural rainfall follows in a reasonable time after planting. Spring plantings have also been successful. Mid-summer planting can be used if supplemental irrigation is provided for seedlings. The concept that must be considered is: If the soil surrounding young seedlings is allowed to dry down in the root zone, weakening and mortality is likely to occur. This concept should be provided for in any planting plan.

[xix] Native mulches, when used in the proper amount, can provide long term stabilization, decrease evaporation and ameliorate soil surface temperatures. Additionally, native mulches may contain local micro-flora and fauna as well as nutrients, especially if duff material is included. It is important to consider the source of materials, especially pine needles, when designing and planning for a project. Pine needles are typically available during the spring and early summer from a variety of sources. However, materials may need to be reserved or arranged for well in advance of a Fall project.

[xx] Straw may be associated with importation of non-local flora as well as noxious weed seeds. If straw is to be used, a locally collected native grass straw is preferred. If that is not available, a commercially available native grass straw may be used, if available (Conservaseed- (916) 775-1646). The useful life of straw mulch is 1-3 years, depending upon soil and other environmental conditions. Native plants tend to be slow to germinate and generally are slower growing than aggressive non-natives are. Given this reality, a long lasting mulch cover is a necessity.

[xxi] Wood chips have been shown to provide an effective mulch cover for erosion control. However, their effectiveness for plant regeneration has not yet been well established. Further work is being conducted by the Caltrans Erosion Control Lab. Wood chips are not, therefore, acceptable as the sole mulch material on revegetation projects at this time.

[xxii] The specific thickness of mulch cover will depend upon the type and consistency as well as the density of the mulch material. However, as a rule, most of the ground surface (>95%) should be covered. Thickness for pine needle mulch will range from 0.5 inches to 1.5 inches, depending on site parameters, the type of material used and application method.

[xxiii] Plastic materials present wildlife and aesthetic concerns. Materials such as coconut fabric (coir), jute and hemp are appropriate materials for restoration-based erosion control projects.

[xxiv] Maintenance can be a crucial component of the overall project. If a project is carefully planned and executed, maintenance should be minimized. However, if maintenance is required, it could determine the difference between successful establishment and marginal establishment.

[xxv] Irrigation can be used to assist plant community establishment but should be carefully planned and applied.

- ❖ Irrigation should be appropriate for the plant community and plant type. Design should be done by a qualified irrigation system designer and should be installed by trained personnel.
- ❖ Irrigation should be low-flow so that input rate does not drastically exceed infiltration rate. This type of design allows water to permeate to the root zone and beyond, which encourages a deeper root system and minimizes run-off.
- ❖ Irrigation should only be used to supplement natural precipitation during dry periods and then only as an aid to establishment. Permanent irrigation should only be used for landscape projects and never on revegetation or restoration projects. Excess irrigation will act to encourage non-native and/or wet-site plants that will die off after irrigation is removed.

[xxvi] This component must be written into the initial proposal and translated to the contract, especially if a maintenance component is to be included. Specific ratios should be determined by the revegetation specialist.

[xxvii] Currently, the Nevada Tahoe Bond Act TAC does not require ongoing monitoring. However, a minimum of as-built documentation and photo-point monitoring should be included as part of the project. This monitoring plan should include photo-point locations, the time of the year that the photos will be taken and the name of the person responsible for monitoring. Photos should be taken before the project begins, immediately after the project and once a year for three years. Post project photos should be taken at the same time each year, preferably in the early fall.