

Chuska Energy Co., Black Rock #6
17,40N,29E. NW SE #869

D

WATER ANALYSIS REPORT

Davis with analysis file



DATE: 17 November 1989
 TO: Chuska Energy Company
 315 N. Behrend
 Farmington, NM 87401
 Attn: Tom McCarthy

PAGE:
 LAB NO.:

TECH, Inc.
 333 East Main
 Farmington
 New Mexico
 87401
 506/327-3311

Sample From Blackrock
 Env. water

Date Sampled 11/10/89 Sampled
 Time Sampled By

PARAMETER	mg/l	me/l	PARAMETER	mg/l	me/l
Acidity (CaCO ₃)			Arsenic		
Alkalinity (CaCO ₃)			Barium		
Bicarbonate			Boron		
Carbonate			Cadmium		
Hydroxide			Calcium		
Chloride			Chromium, Hex		
Chlorine, Free			Total		
Total			Iron, Dissolved		
Fluoride			Total		
Nitrogen, Total			Lead		
Nitrate (N)			Magnesium		
Ammonia (N)			Mercury		
Phosphate, Ortho			Potassium		
Total			Selenium		
Sulfur, Sulfate			Silver		
Sulfide			Sodium		
BOD ₅			Gross Alpha	21+/-14	
COD			Gross Beta	54+/-7	
Hardness (CaCO ₃)		gr.			
Oil & Grease					
Oxygen, Dissolved					
Phenols					
Solids, Total					
Dissolved					
Suspended					
Settleable		ml/l			
Conductivity		µmhos/cm			
pH		units			
Turbidity		NTU			

Date Received 11/10/89 Preserved? _____ Date Analyzed 11/13/89 Analyzed By CEP

REMARKS:

AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC, AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL.

APPLICATION FOR PERMIT TO DRILL OR RE-ENTER
AZ OIL & GAS
 APPLICATION TO DRILL **CONSERVATION COMMISSION** RE-ENTER OLD WELL

OCT 23 1989

NAME OF COMPANY OR OPERATOR

Chuska Energy Company

Address 315 N. Behrend

City Farmington

State N.M.

Drilling Contractor

(To be Determined)

Address

DESCRIPTION OF WELL AND LEASE

Federal, State or Indian Lease Number, or if fee lease, name of lessor

NOG 8702-1116

Well number

Black Rock 6

Elevation (ground)

6700' GR

Nearest distance from proposed location to property or lease line:

1,450

feet

Distance from proposed location to nearest drilling, completed or applied—for well on the same lease:

3415'

feet

Number of acres in lease:

50,000

Number of wells on lease, including this well, completed in or drilling to this reservoir:

4

If lease, purchased with one or more wells drilled, from whom purchased:

N/A

Well location (give footage from section lines)

1510' FSL x 1410' FEL

Section—township—range or block and survey

Sec. 17, T40N, R29E

Dedication (Comply with Rule 105)

Field and reservoir (if wildcat, so state)

Black Rock Paradox

County

Apache

Distance in miles, and direction from nearest town or post office

7 miles west-southwest of Teec Nos Pos, Arizona

Proposed depth:

6480'

Rotary or cable tools

rotary

Approx. date work will start

1/1/1990

Bond Status Pending

Organization Report

Filing Fee of \$25.00

Amount \$25,000

On file Or attached

Attached

Remarks:

Primary Zone is intended to be the Paradox Formation. If the Paradox appears to be productive, the well will TD @ 6110'. If the Paradox is not productive, the well will be deepened to 6440' for use as a SWD well.

CERTIFICATE: I, the undersigned, under the penalty of perjury, state that I am the Operations Manager of the

Chuska Energy Company (company), and that I am authorized by said company to make this report; and that this report was prepared under my supervision and direction and that the facts stated therein are true, correct and complete to the best of my knowledge.

Signature

10-18-89

Date

Permit Number: 869

Approval Date: 01/02/90

Approved By:

Notice: Before sending in this form be sure that you have given all information requested. Much unnecessary correspondence will thus be avoided.

STATE OF ARIZONA
 OIL & GAS CONSERVATION COMMISSION
 Application to Drill or Re-enter

File Two Copies

Form No. 3

(Complete Reverse Side)

STATE OF ARIZONA
OIL AND GAS CONSERVATION COMMISSION

PERMIT NO. 869

REPORT ON PROPOSED OPERATIONS

Chuska Energy Company
315 N. Behrend
Farmington, NM 87401

Phoenix, Arizona
January 2, 1990

Your proposal to drill well Black Rock No. 6 A.P.I. No. 02-001-20288
Section 17, T. 40N, R. 29E, G&SR B. & M., Black Rock field, Apache County,
dated 10/18/89 received 10/23/89 has been examined in conjunction with records filed
in this office.

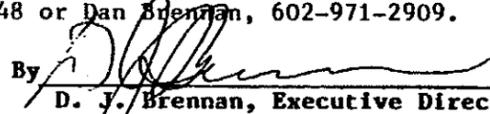
THE PROPOSAL IS APPROVED PROVIDED:

1. THIS WELL SHALL NOT BE USED FOR SALT WATER DISPOSAL UNLESS AUTHORIZED BY THE COMMISSION AFTER NOTICE AND HEARING PURSUANT TO RULE 12-7-176.
2. Mud pits are constructed and lined in a manner that will prevent contamination of surface or subsurface waters.
3. Drilling mud consistent with sound drilling practices shall be used at all times and sufficient amounts of lost circulation material shall be available at the drill site.
4. The well shall be cased and cemented in such a manner that will protect all zones that contain oil, gas, or fresh water.
5. Blowout prevention equipment shall be installed, tested, and maintained in a manner necessary to assure well control throughout the drilling, completion, or abandonment of the well.
6. An H₂S safety company shall be on location from 4000' to T.D.
7. Sundry reports shall be filed as required.
8. Two sets of samples of all cores and cuttings shall be taken at a maximum interval of ten feet. One set each shall be shipped prepaid to:
 - a. Oil & Gas Commission, 5150 N. 16th St., Ste. B141, Phoenix, AZ 85016.
 - b. Arizona Geological Survey, 845 N. Park Ave., Tucson, AZ 85719.
9. Samples and all logs and surveys of any description shall be filed within 30 days after the removal of the rig from the hole.
10. Application to Plug and Abandon (Form 9) shall be submitted to the Commission for approval prior to the beginning of operations to plug the well.
11. THIS COMMISSION SHALL BE NOTIFIED:
 - a. Immediately when drilling operations commence.
 - b. In time to witness the running and cementing of the surface casing.
 - c. In time to witness pressure testing of BOPE prior to drilling out of the surface casing.
 - d. In time to witness plugging and abandonment operations.

To witness operations, call 602-255-5161.

After office hours notify: Steve Rauzi, 602-864-9148 or Dan Brennan, 602-971-2909.

C.D. # 2578904, Valley National Bank

By 
D. J. Brennan, Executive Director

A COPY OF THIS REPORT AND THE PROPOSAL MUST BE POSTED AT THE DRILLER'S STATION PRIOR TO COMMENCING OPERATIONS.

RECORDS FOR WORK DONE UNDER THIS PERMIT ARE DUE WITHIN 30 DAYS AFTER THE WORK HAS BEEN COMPLETED OR THE OPERATIONS HAVE BEEN SUSPENDED.



PERMIT TO DRILL

This constitutes the permission and authority from the
OIL AND GAS CONSERVATION COMMISSION,
STATE OF ARIZONA,

To: GRUSKA ENERGY COMPANY
OPERATOR

to drill a well to be known as

Black Rock #6
WELL NAME

located 1510 PSLs; 1410 FBL

Section 17 Township 40N. Range 29E. Apache County, Arizona.

The SE 1/4 of said
Section, Township and Range is dedicated to this well.

Said well is to be drilled substantially as outlined in the attached Application and must be drilled
in full compliance with all applicable laws, statutes, rules and regulations of the State of Arizona.

Issued this 2 day of January, 1990.

OIL AND GAS CONSERVATION COMMISSION

By: [Signature]
EXECUTIVE DIRECTOR

PERMIT 002889

RECEIPT NO. 2903

A.P.I. NO. 02-001-20288

[Signature]
State of Arizona
Oil & Gas Conservation Commission
Permit to Drill
FORM NO. 27

CHUSKA ENERGY COMPANY

10 POINT DRILLING PLAN

BLACK ROCK 1-17-40N29E WELL NO. 6
SECTION 17, TOWNSHIP 40N, RANGE 29E
1510' FSL, 1450' FEL
APACHE COUNTY, ARIZONA

1. SURFACE FORMATION The geological name of the surface formation is the Morrison.
2. ELEVATION
The surface elevation is 6700' GR / 6712' KB.
3. ESTIMATED FORMATION TOPS

<u>Depth</u>	<u>Formation</u>	<u>Sub Sea Elevation</u>
Surface		+ 6712'
1995'	Chinle	+ 4717'
3005'	De Chelley	+ 3707' Water
3373'	Organ Rock	+ 3339'
4015'	Cutler	+ 2697'
4735'	Hermosa	+ 1977' Gas
5325'	Ismay	+ 1387' Gas
5385'	Lower Ismay	+ 1327' Gas
5493'	Desert Creek	+ 1229' Gas
5625'	Akah	+ 1087' Gas/Water
5782'	Barker Creek	+ 930' Gas
5909'	Pinkerton Trail	+ 803' Gas
6112'	Molas	+ 600'
6176'	Mississippi	+ 536'
6331'	Mississippi Dolomite	+ 381'
6440'	Ouray	+ 272'
6480'	Total Depth	+ 232'

Note: Well will T. D. at 6152'. If Paradox appears unproductive the well will be deepened to T. D. at 6480' for use as SWD well in the Mississippi Dolomite.

4. PROPOSED CASING/CEMENTING PROGRAM

	<u>Size</u>	<u>Weight</u>	<u>Grade</u>	<u>Coupling</u>
Surface:	8 5/8"	24 lb/ft	K-55	STC
Production:	5 1/2"	15.5 lb/ft	K-55	STC

Surface Cementing:

360 sx Class G cement with 2% CaCl₂ & 1/4#/sx Celloflake.
Weight 15.8 ppg, yield 1.15 ft³/sx.

Production Cementing:

First Stage

T.D. to 3200'. Lead with 113 sx 35:65 POZ cement, 6% Gel, .5% D-127 Flac, 1% CaCl₂, 1/4#/sx Celloflake. Tail with 486 sx Class G, 3% KCL, .6% D-60 Flac, 1/4#/sx Celloflake.

Second Stage

3200' to surface casing shoe. 304 sx 35:65 POZ cement with 6% Gel, .5% D-127 Flac, 1% CaCl₂, 1/4#sx Celloflake.

SWD CEMENTING

DV Tool at 3800'

First Stage

TD to 3800'. Lead with 282 sx 35:65 POZ cement with 6% Gel, .5% D-127 Flac, 1% CaCl₂, 1/4#/sx Celloflake. Tail with 160 sx Class G, 3% KCL, .6% D-60 Flac, 1/4#/sx Celloflake.

Second Stage

3800' to Surface Casing Shoe. 429 sx 35:65 POZ cement with 6% Gel, .5% D-127 Flac, 1% CaCl₂, 1/4#/sx Celloflake.

All cement volumes will be recalculated after examination of caliper log.

5. BLOWOUT PREVENTER (See attached schematics)

As no abnormal pressures are anticipated, a 2000 psi BOP system would be sufficient for the drilling of this well. However, due to availability constraints, a 3000 psi system will be used, as per the attached Exhibits "A" and "B". This will be a 10" x 900 Series double ram preventer, equipped with a set of pipe and blind rams.

An accumulator system, with a pressure capacity sufficient to operate the rams three complete cycles without rig power, will be required by the contractor.

6. PROPOSED MUD PROGRAM

Surface to 3500'

Native solids, weight 8.3-8.7 ppg, with gel sweeps as necessary to clean hole.

3500' to Total Depth

Low solids non dispersed system with Polymer. 8.6 - 8.8 ppg. Fluid loss 15 CC's or less. Fluid loss will be 10 CC's or less drilling across Paradox Zone.

7. AUXILIARY EQUIPMENT.

- A. A kelly cock will be utilized while drilling this well, with handle available on the rig floor.
- B. Floor (stabbing) valves will be available, on the rig floor at all times, with necessary subs to fit all of the drilling assemblies.
- C. Mud will be used to drill this well. No abnormal pressures are expected. A mud logging unit will be utilized while drilling this hole.

8. WELL EVALUATION

Open hole electric logging program will consist of a minimum of dual lateral log, SP, Gamma Ray, Caliper, FDC-CNL Lithodensity from TD to 4000'.

Drill stem testing will be as per well site geologist's recommendations, based on shows. A mud logging unit will be utilized during drilling.

9. ABNORMAL PRESSURES/GAS

No abnormal pressures are anticipated. Monitoring of gas and hydrocarbon shows will be by wellsite mud logging unit. An H₂S safety company will be on location from 4000' to TD.

10. TIMING

The drilling and evaluation of this well will take 18 days. Anticipated spud date is 1-1-90.

DETAILED DRILLING PROGRAM

BLACK ROCK NO. 6

DATE: October 9, 1989

WELL NAME: Black Rock 1-17-40N29E WELL NO: 6

LOCATION: 1510' FSL, 1450' FEL
Section 17, Township 40N, Range 29E
Apache County, Arizona

ELEVATION: 6700' GR / 6712' KB

TOTAL DEPTH: 6152' if Paradox is productive; 6480' if an SWD well.

PROJECTED HORIZON: Molas Shale at 6152'; Ouray at 6480'.

DRILLING, CASING AND CEMENTING PROGRAM

1. Move in rotary tools and notify BLM of intent and time of spud.
2. Rig up rotary tools. Drill mouse hole and rat hole. Mix mud prior to spudding well.
3. Drill 12 1/4" hole to 500 +/- . Use cellar jet to remove mud and cuttings from hole. Surveys will be taken on wire line to ensure deviation control. Use fresh water gel/chemical mud for drilling surface hole. Run 8 5/8" surface casing to T.D. Displace casing with mud prior to cementing. Reciprocate casing prior to cementing.
4. Cement with sufficient volume to circulate cement to surface, as per surface cementing program detailed in 10-point drilling plan.
5. W.O.C. a minimum of 4 hours prior to nipping up BOP stack and related equipment. See BOP schematics for details. Minimum total W.O.C. time is 12 hours.
6. Pressure testing of BOP and casing will be to 600 psig for 30 minutes. Pressure test manifold and all related equipment prior to drilling shoe joint.
7. Reduce hole to 7 7/8". Drill to T.D. at 6152'.

8. Open hole logs will be run and evaluated. Drill stem testing will be as per wellsite geologist's recommendation. If well is commercial, 5 1/2" casing will be run to T.D.
9. If well is not commercial, drilling will continue to a T.D. at 6480'. Open hole logs will be run and evaluated over zones from TD up to about 6100' to determine if use of the well for SWD is possible.
10. Cement will be in two stages. Cement as per production or SWD cementing program in 10-point drilling plan. W.O.C. and circulate between stages 4 hours.
11. Remove BOP, set slips, cut off casing, install well head and release drilling rig.
12. If well is non-productive it will be plugged and abandoned as per State, BLM and Navajo Tribal stipulations.

CSWH/10PTBR6



HARKEN SOUTHWEST CORPORATION
(formerly Chuska Energy Company)

January 28, 1994

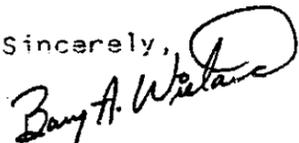
We are pleased to announce that Chuska Energy Company has changed its name to Harken Southwest Corporation. This is in line with the February, 1993 merger with Harken Exploration Company.

Harken Southwest Corporation will continue to be located at 3315 Bloomfield Highway, Farmington, New Mexico 87401. Our telephone number will remain (505) 326-5525.

Please reflect this name change on all future correspondence.

Thank you for your assistance in this matter. We look forward to working with you as Harken Southwest Corporation.

Sincerely,


BARRY A. WIELAND
Operations Manager





CHUSKA ENERGY COMPANY

315 N. BEHREND • FARMINGTON, NEW MEXICO 87401 • PHONE: (505) 326-5525

AZ OIL & GAS
CONSERVATION COMMISSION

DEC 21 1989

December 18, 1989

Mr. Daniel J. Brennan
Arizona Oil and Gas Conservation Commission
5150 North 16th Street, Suite B141
Phoenix, Arizona 85016

RE: Black Rock Nos. 5, 6, 7, 8, 9, 10, and 11
Drilling Permit Applications

Dear Dan:

Pursuant to our conversation on December 15th, I am enclosing a check for \$175.00 for the Applications to Drill the subject wells.

Please advise me if there is additional information or requirements for the approval of the subject APD's.

Sincerely,

Thomas R. McCarthy
Reservoir Engineer

TRM:bnp
Enclosure
File:TRM\DRPERBR



Oil and Gas Conservation Commission

STATE OF ARIZONA

5150 N. 16th STREET, SUITE B-141
PHOENIX, ARIZONA 85016
PHONE: (602) 255-5161

January 2, 1990

Mr. Thomas R. McCarthy
Chuska Energy Company
315 N. Behrend
Farmington, NM 87401

RE: Black Rock No. 5, State Permit No. 868
Black Rock No. 6, State Permit No. 869
Black Rock No. 7, State Permit No. 870
Black Rock No. 8, State Permit No. 871

Dear Tom:

Enclosed are the filing fee receipt, the approved Application for Permit to Drill, Permit to Drill, and Report on Proposed Operations for each of the referenced wells. Please note that we have not approved these wells for use as salt water disposal wells.

Upon successful completion of any of these wells, please send in a completed copy of the enclosed Form 4 for our records. I am also enclosing copies of other forms you will need when you have a successful gas well completion (Forms 3, 7, 8, 11, 12, 13, 14, 18, 20).

Sincerely,

Steven L. Rauzi

Steven L. Rauzi
Oil & Gas Specialist

Enclosures

ASSIGNMENT TO ARIZONA STATE TREASURER
 SECURITY IN LIEU OF CASH DEPOSIT FOR COMPLIANCE WITH
 SECTION 35-155 ARIZONA REVISED STATUTES

AZ OIL & GAS
 CONSERVATION COMMISSION

DEC 11 1989

NAME Chuska Energy Company
 STREET ADDRESS 1250 N.E. Loop 410 Suite 710 San Antonio CITY
 COUNTY Bexar STATE Texas TELEPHONE NUMBER 512-821-6194

hereinafter referred to as ASSIGNOR, does hereby assign and transfer to the Treasurer of the State of Arizona, hereinafter referred to as the TREASURER, all right, title and interest of any kind whatsoever, owned or held by Assignor in the principal, but not in the interest hereinafter accruing after the date of this assignment in the insured account of ASSIGNOR so long as such funds remain on deposit in the

Valley National Bank of Arizona - Valley Center Office
 FINANCIAL INSTITUTION

whose address is 241 N. Central Phoenix Mariposa
 STREET ADDRESS CITY COUNTY

Arizona, as evidenced by an account in the amount of Twenty-Five Thousand
 dollars (\$ 25,000) identified by account number 8272-4968 which account is insured by the
 Federal Deposit Insurance Corporation or the Federal Savings and Loan Insurance Corporation. This assignment is given as security for
 compliance with ARS 27-501 to 539 and with the Rules of the Oil and Gas Conservation
 Commission.

Dated this 30th day of November, 19 89, at San Antonio Texas
Arizona

IMPORTANT - SIGNATURE OF ASSIGNOR

This Assignment shall be signed by the
 Individual Himself

Chuska Energy Company
 NAME OF ASSIGNOR EXACTLY AS SHOWN ABOVE
 BY: Manuel P. Neehan Executive Vice
 SIGNATURE OF ASSIGNOR President

FIRST ENDORSEMENT - RECEIPT FOR NOTICE OF ASSIGNMENT

Receipt is hereby acknowledged to the Treasurer of the State of Arizona, hereinafter referred to as the TREASURER, of written notice of the assignment to said Treasurer of the above-identified account. We have noted our records to show the interest of the Treasurer in said account as shown in and by the assignment above. We have retained a copy of this document. We hereby certify that we have not received any notice of lien, encumbrance, hold, claim or other obligation against the above-identified account prior to its assignment to the Treasurer. We further hereby waive any current and future right of set-off against such account. We agree to make payment as required by the Rules and Regulations of the Treasurer adopted in accordance with applicable laws and the law applicable to this institution.

Dated this 14 day of December, 19 89, at Phoenix, Arizona

BY: [Signature] Valley National Bank of Arizona
 SIGNATURE OF OFFICER OF FINANCIAL INSTITUTION NAME OF FINANCIAL INSTITUTION
[Signature] TITLE

Subscribed and sworn before me this 14 day of December, 19 89.
 NOTARY PUBLIC SIGNATURE
 My Commission Expires Sept. 30, 1993
 COMMISSION EXPIRES

SECOND ENDORSEMENT - RECEIPT FOR SECURITY AND DIRECTION TO PAY EARNINGS

Receipt is acknowledged of the assignment above and the account identified in the assignment above. The financial institution named in the assignment above is hereby authorized and directed to pay any earnings credited after the date of this assignment on the above-identified account of the above-named assignor.

Dated this 14th day of DECEMBER, 19 89, at PHOENIX Arizona

ARIZONA STATE TREASURER
 Treasurer or Authorized Representative
 By: Brian R. Oleson
 (Prepare in duplicate. Please Type all Information)

Attach Original Assignment to Certificates of Deposit and File with State.

RECEIVED
 STATE TREASURER
 68. 11 30 PM '89

SECURITIES SAFEKEEPING
 1700 WEST WASHINGTON ST. - PHOENIX, ARIZONA 85007

DATE: 12/14/89

STATE AGENCY NO. _____

STATE AGENCY AZ OIL & GAS CONSERVATION COMM.

State Treasurer's Use Only

COMPANY CHUSKA ENERGY CO.
1850 Mt Diablo Blvd, Ste 640
Walnut, CA 94500

DOMESTIC FOREIGN

DEPOSIT

C.D. NO.: 2578904 ✓
 ACCT NO.: 8272-4968 ✓
 BANK: Valley National Bank of Arizona ✓

RECEIVED
STATE TREASURER
DEC 14 1989 1:54 PM '89

MATURITY DATE: 05/30/90 ✓ INTEREST RATE: 7.30 %

AMOUNT \$25,000.00 ✓

C.D. ASSIGNMENT MUST BE ATTACHED UNLESS C.D. IS PAYABLE TO STATE TREASURER

RELEASE

C.D. NO.:

BANK:

MATURITY DATE: INTEREST RATE: %

AMOUNT \$

STATE TREASURER VALIDATION NO. _____

RECEIVED THE ABOVE RELEASE		STATE AGENCY AUTHORIZATION	
		BY <u>Helen Barnes</u> Authorized Signature	
BY _____ Authorized Signature	Date _____	STATE TREASURER AUTHORIZATION	
Bank or Firm _____		BY <u>Brian R. Oleson</u> Authorized Signature	
FOR BANK USE ONLY		BANK AUTHORIZATION	
Checked by _____	Verified by _____	BY _____ Authorized Signature	
		STATE'S DEPOSITORY BANK	



Valley National Bank of Arizona

BRANCH Valley Center

Certificate of Deposit
NON TRANSFERABLE

2578904
12-1-89

BRANCH NO. 07 DATE

THIS CERTIFIES THAT THERE HAS BEEN DEPOSITED IN THIS BANK

VALLEY NATIONAL BANK 25,000.00

PAY TO

Arizona State Treasurer

ACCOUNT NO.

8272-4968

\$ 25,000.00

(UPON SURRENDER OF THIS CERTIFICATE PROPERLY ENDORSED)

For Chuska Energy Co
1850 Mt Diablo Blvd Ste 640
Walnut CA 94500

THIS CERTIFICATE MATURES IN 180 Days FROM ISSUE DATE ON
May 30, 1990 INTEREST IS TO BE PAID Monthly
AT THE RATE OF 7.3 % PER ANNUM ON A 365 DAY YEAR BASIS.
FIRST INTEREST PAYMENT DUE 12-30-89

SINGLE MATURITY - INTEREST CEASES AT MATURITY.

AUTOMATICALLY RENEWABLE - THIS CERTIFICATE WILL AUTOMATICALLY RENEW EVERY

UNLESS REDEEMED WITHIN 10 CALENDAR DAYS (ONE BUSINESS DAY FOR MATURITIES OF 31 DAYS OR LESS) AFTER ANY MATURITY. THE BANK RETAINS THE RIGHT TO REDEEM THIS CERTIFICATE OR CHANGE THE INTEREST RATE AS OF ANY MATURITY.

0-100-0075 REV. 6/85

Janet ...
AUTHORIZED SIGNATURE