F-6

DTE-612-89

COMMONWEALTH of VIRGINIA

Department of Air Pollution Control

ROOM 801, NINTH STREET OFFICE BUILDING
POST OFFICE BOX 10089
RICHMOND, VIRGINIA 23240
(804) 786-2378
FAX # (804) 225-3933
TDD # (804) 371-8471

WALLACE N. DAVIS
EXECUTIVE DIRECTOR

RECEIVED
JAN 26 1990
REGION VI

November 24, 1987
(Revised January 5, 1990)

Mr. Howard B. Phillips, President
Dominion Terminal Associates
P. O. Box 967A
Newport News, VA 23607

Location: Newport News, Virginia
Registration No: 60997
County-Plant No: 2120-0074

Dear Mr. Phillips:

Attached is a revised permit to construct and operate a coal storage and export facility at your terminal in Newport News, Virginia in accordance with the provisions of the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution.

In the course of evaluating the application and arriving at a final decision to approve the project, the Virginia State Air Pollution Control Board (SAPCB) deemed the application complete on November 27, 1989. This revised permit replaces all existing Virginia State Air Pollution Control Board (SAPCB) permits for this facility.

This approval to construct and operate shall not relieve Dominion Terminal Associates of the responsibility to comply with all other local, State and Federal air pollution control regulations.

If you have any questions concerning this permit, please contact the Director, Region VI, at (804) 424-6707.

SUPERCEDED

Sincerely,

Wallace N. Davis

Wallace N. Davis
Executive Director

WND/ER/KLM/edb
Attachment: Permit

cc: Director, Division of Technical Evaluation
Director, Division of Computer Services
Director, Region VI
Old Greenbrier Village, Suite A
2010 Old Greenbrier Road
Chesapeake, VA 23320-2168

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WALLACE N. DAVIS
EXECUTIVE DIRECTOR

PERMIT TO CONSTRUCT AND OPERATE

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Dominion Terminal Associates
P. O. Box 967A
Newport News, Virginia 23607
Registration No. 60997
County-Plant No. 2120-0074

is authorized to construct and operate

a coal storage and export facility

located at

Pier 11, Harbor Road
Newport News, Virginia

in accordance with the Specific Conditions (emission limitations, monitoring and testing requirements) and the General Conditions set forth in Parts I and II herein.

Approved this twenty-fourth day of November, 1987 (Revised January 5, 1990).

Wallace N. Davis

Wallace N. Daivs
Executive Director

Permit Consists of 21 pages.
Part I - Specific Conditions 1 to 19.
Part II - General Conditions 1 to 16.
Part III - Document List, 6 items.

PART I - SPECIFIC CONDITIONS - the regulatory reference and authority for each condition is listed in parenthesis () after each condition.

1. Dominion Terminal Associates is located in Newport News, Virginia.

2. Construction and operation shall be conducted as proposed in the permit application dated August 17, 1981 and amended on August 25, 1981 and October 19, 1989. The permit application and supporting documents (see Document List) are a part of this permit.
(Section 120-02-11 of State Regulations)

3. The equipment to be installed consists of:

   - rotary rail car dumper and other coal handling and storage equipment.

   - a permanent wet suppression system which can completely wet all coal storage piles

4. The yearly throughput of coal shall not exceed 20 x 10^6 tons.
(Section 120-02-11 of State Regulations)

5. The average and maximum quantity of coal in storage at any one time shall not exceed 0.95 x 10^6 and 1.4 x 10^6 tons, respectively.
(Section 120-02-11 of State Regulations)

6. Fugitive coal dust emissions from the storage piles shall be controlled by a wet suppression system capable of wetting the entire coal storage area.
(Section 120-08-01 F of State Regulations)

7. Coal dust emissions from the rotary dumper and transfer points shall be controlled by wet suppression which shall include the use of a surfactant. The surfactant to water ratio shall not be less than one gallon surfactant to every 3,500 gallons of water.
(Section 120-08-01 F of State Regulations)

8. Coal dust emissions from the surge silos shall be controlled by baghouses at least 99 percent efficient.
(Section 120-05-04 of State Regulations)

9. Opacity at all emission points shall be limited to less than 5 percent.
(Section 120-02-11 of State Regulations)

10. Dominion Terminal Associates shall install and operate a PM10 monitor at the Newport News Housing Authority Maintenance Building (180-J) to ascertain the ambient air quality in the area surrounding the coal terminal. Operation shall be in accordance with Appendix J of 40 CFR Part 50.

11. The wet suppression system for the coal storage piles shall be implemented as specified in Appendix A or by any other procedure as may be approved by the Board prior to use. Such approval shall be contingent on adequate documentation that any alternative procedure shall achieve at least as high an efficiency as Appendix A. Requests for changes in procedure shall be accompanied by an explanation of the proposed changes and the anticipated effect they shall have. These requests, if approved by the State Air Pollution Control Board, shall be subject to a test and evaluation procedure prior to being accepted as permanent changes to the control procedures.
(Section 120-02-11 of State Regulations)

12. Each spray cycle shall attain 100 percent coverage of the coal storage area and shall consist of at least 35,500 gallons of water including assurance cycles.
(Section 120-05-0403 of State Regulations)

13. One person each shift shall be designated as responsible for compliance with the procedures of Appendix A. Required actions in support of these procedures shall take precedence over routine coal handling procedures.
(Section 120-02-11 of State Regulations)

14. Operating personnel at Dominion Terminal Associates shall be informed of their company's responsibilities under this permit. With respect to compliance with the permit, operating personnel shall be informed by their supervisors that they, as individuals, as well as their employer are responsible for compliance with the conditions of this permit to the extent that their failure to perform their individual duties and responsibilities lead to noncompliance with the conditions of this permit. The following actions are considered as detrimental to the control of coal emissions, but are not limited to:

    a. Failure to stop any coal movement operation when it becomes known that installed air pollution control systems are inoperative and would cause excess emissions.

    b. Failure to stop a coal movement operation when it becomes known that pieces of coal handling equipment needed for that operation are malfunctioning or operating significantly below designated specifications.

    c. Failure of equipment operators to take immediate precautions to preclude fugitive dust emissions from the operation of bulldozers, front-end loaders, automobiles or trucks (i.e., through the use of water suppressant to control the dust, or limiting the speed of movement to below 10 miles per hour).

d. Failure of personnel to give precedence to controlling fugitive dust emissions over routine coal operations to personnel designated with the responsibility of controlling fugitive emissions.
(Section 120-02-11 of State Regulations)

15. Whenever Dominion Terminal Associates is using a particular piece of coal handling equipment (e.g. a dumper, a conveyor, etc.), it shall utilize the wet suppression controls for that piece of equipment unless the use of such equipment would cause a safety hazard or damage to the equipment from freezing.
(Section 120-02-11 of State Regulations)

16. Any significant malfunction of equipment that significantly affects the operation of the wet suppression system shall be reported to the State Air Pollution Control Board by telephone as soon as practicable. In the event of such malfunctions, auxiliary watering devices shall be used until such time as the regular equipment is repaired. A log of such action and corrective action shall be maintained for evaluation of impact.
(Section 120-02-11 of State Regulations)

17. All coal storage piles shall be truncated and compacted so as to minimize fugitive coal dust emissions.
(Section 120-05-0403 of State Regulations)

18. The representatives of Dominion Terminal Associates shall meet on a regular basis to discuss the implementation of the conditions of this permit.
(Section 120-02-11 of State Regulations)

19. Copies of this permit shall be available for reference at the facility and operating personnel shall be apprised and trained in the portions of the permit related to their duties and the need to control coal emissions.
(Section 120-02-11 of State Regulations)

PART II - GENERAL CONDITIONS

1. Within 10 days after receiving this permit the permittee shall notify the Board (Director, Region VI) in writing of the estimated start-up date of the permitted facility. This notification is for administrative purposes only and need not be a firm date.
(Section 120-02-11 of State Regulations)

2. Quarterly reports on the progress of construction shall be submitted to the Director, Region VI, beginning December 30, 1989.
(Section 120-02-11 of State Regulations)

3. The permittee shall furnish written notification to the Board (Director, Region VI) of:

   a. The actual date on which construction commenced within 30 days after such date.

   b. The anticipated start-up date postmarked not more than 60 days nor less than 30 days prior to such date.

   c. The actual start-up date within 15 days after such date.
   (Section 120-05-05 of State Regulations)

4. The permitted facility shall be designed and constructed so as to allow emissions testing using the methods prescribed upon reasonable notice at any time.
   (Sections 120-05-03 and 120-06-03 of State Regulations)

5. The permittee shall retain records of all emission data and operating parameters required by the terms of this permit including Appendix A. These records shall be maintained by the source for a period of at least two years. These records shall include coal in storage for each day, and the annual throughput.
   (Sections 120-05-05 and 120-06-05 of State Regulations)

6. All wet suppression equipment operators shall be trained and certified in the proper operation of all such equipment. Dominion Terminal Associates shall maintain records of the required training and certification. Certification of training shall consist of a statement of time, place and nature of training provided.
   (Section 120-02-11 of State Regulations)

7. The company shall develop, maintain, and have available to all operators good written operating procedures for all wet suppression equipment. A maintenance schedule for all such equipment shall be established and made available to the State Air Pollution Control Board for review. Records of service and maintenance shall be maintained on file by the source for a period of two years.
   (Section 120-02-11 of State Regulations)

8. The Board reserves the right to modify and, if appropriate, to reissue or to rescind this permit if prior to operation there is a substantive change to the design capacity or the fundamental nature of the process or control equipment such that the potential to emit of any facility is increased.
   (Section 120-02-11 of State Regulations)

9. The Board reserves the right to modify and, if appropriate, to reissue or to rescind this permit if prior to operation there is a substantive change in any of the data upon which the decision to approve this permit was based.
(Section 120-02-11 of State Regulations)

10. All local zoning and building requirements must be met before commencing construction.
(Section 120-02-11 of State Regulations)

11. If, for any reason, the permittee does not comply or shall not be able to comply with the emission limitations or other conditions specified in this permit, the permittee shall provide in writing to the Board (Director, Region VI) the following information as soon as possible but no later than five days after such conditions become known to the permittee:

    a. description of noncompliance;

    b. cause of noncompliance;

    c. anticipated time the noncompliance is expected to continue or, if corrected, the actual duration of noncompliance;

    d. steps taken by the permittee to minimize or eliminate the noncompliance; and

    e. steps taken by the permittee to prevent recurrence of the noncompliance.

    Submittal of this report does not constitute a waiver of the emission limitations or other conditions of this permit nor does it in any way restrict the SAPCB's authority to enforce the permit conditions pursuant to Section 113 of the Clean Air Act.
    (Section 120-02-11 of State Regulations)

12. The permitted facility is to be constructed and operated as represented in the permit application referenced in Condition 2 of Part I. No changes in the permit application specifications or any existing facilities shall be made which alter the emissions into the ambient air or alter the impact of the facility on air quality without the prior written approval of the Board.
(Section 120-02-11 of State Regulations)

13. The facility shall operate in compliance with Rules 4-3 and 5-3, Non-Criteria Pollutants. No changes in the facility that cause the emission of additional non-criteria pollutants shall be made without the prior written approval of the Board.
(Sections 120-04-0305 and 120-05-0305 of State Regulations)

14. In the event of any change in control of ownership of the permitted source, the permittee shall notify the succeeding owner of the existence of this permit by letter and send a copy of that letter to Director, Region VI.
(Section 120-02-11 of State Regulations)

15. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of that provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
(Section 120-02-11 of State Regulations)

16. This permit approval is only applicable to the permit requirements of the State Air Pollution Control Board and does not alter permit requirements by any other local, state, or federal government agency. Dominion Terminal Associates is cautioned that approval of this permit should not be construed to mean its operation is automatically in compliance with all aspects of the Regulations for the Control and Abatement of Air Pollution. State Air Board personnel shall be constantly evaluating all sources for compliance with Part V, Section 120-05-0103 - Standard for Visible Emissions, Section 120-05-0104 - Standard for Fugitive Dust/Emissions, and Section 120-05-0203 - Standard for Odorous Emissions. Compliance with all air pollution regulations must be a continuing, full time effort.
(Section 120-02-11 of State Regulations)

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data shall necessitate your response to requests for information to include, as appropriate: fuel consumption by type, heat value, sulfur and ash content; process and production data; refuse disposal by incineration including auxiliary fuels burned; storage, handling and use of liquid organic compounds; and, changes in stack data, control equipment, and operating schedules. Such requests for information from the Regional Office shall either be in writing or by personal contact of field enforcement personnel. Emissions data provided to the Board by a source must be made available to the public upon request; process data for individual facilities and plants shall be made available to the public upon request unless the source claims, in writing, the information is proprietary and that it should be held as confidential.
(Section 120-02-31 of State Regulations)

PART III - DOCUMENT LIST

1. Permit application signed by Mr. F. J. Manusco, dated July 29, 1981.

2. State Air Pollution Control Board, Region VI engineering analysis, dated September 10, 1981.

3. Mathematical Supplement to: "Control of Fugitive Emissions from Open Coal Storage in Newport News, Virginia," page 67 "Control Methodology."

4. Dominion Terminal Associates letter, dated May 3, 1989 and signed by Mr. Howard B. Phillips.

5. Revised permit application, dated October 19, 1989 and signed by Mr. Thomas N. Houck, P.E.

6. DAPC, Region VI engineering analysis, dated November 22, 1989.

APPENDIX A

This appendix is to be considered a part of the State Air Pollution Control Board permit to operate the Dominion Terminal Associates (Dominion) coal terminal. All procedures outlined in this appendix are enforceable as a condition of operating.

Dominion shall record the following parameters on an hourly basis:

Average hourly temperature (T) in degrees Fahrenheit

Average hourly relative humidity (RH)

Average hourly wind speed in miles per hour (SP)

Average hourly wind direction (DIR)

Hourly rain in inches

Hourly occurrence of fog (visibility of 4 miles or less)

Density of air P from the equation $P = -0.0001478(T) + 0.0853$

Viscosity of air (1.68u) from the following equations

$-24.88 < T \leq 32$	$1.68u = 0.0001207(T) + 0.0655479$
$32.00 < T \leq 64.40$	$1.68u = 0.0001493(T) + 0.0646353$
$64.40 < T \leq 104$	$1.68u = 0.0001344(T) + 0.0655899$

K as determined by the equation: $K = SP(T/RH)\ (P/u\ 1.68)$

Dominion shall use the data listed above for a computerized spreadsheet in a format as described below, maintaining the records to be submitted to the Board upon request.

The program outlined in Appendix A when properly programmed will provide for calling up on the hour a visual display (graph) which depicts the following:

a. $\underline{CE_{unc}\text{ for the KT predicted}}$: will change by the new hourly prediction of KT. At the end of the day will represent the potential uncontrolled coal emissions experienced in the past 24 hours.

b. Slope of the uncontrolled intended movement with time for the PASS-1 sustem without controls: will change by the new hourly prediciton of KT.

c. PASS-1 line, with hourly markings in proportion depicting the controlled to the hourly K, emission level attained when controls are applied. This line's slope and value will vary as suppression cycles are applied. The extension of this line depicts the near low end of the day value in $\mu g/m^3$, if no further cycles are applied and is the primary control medium. It generates from the uncontrolled slope line (b.).

d. PASS-0 line, depicting the controlled emissions level attained when controls are applied. This line's slope as in (c) will vary as suppression cycles are applied. The extension of this line depicts the near high end of the day value in $\mu g/m^3$, if no further cycles are applied. When, due to cycles, the PASS-0 line and the PASS-1 line are one and the same, their extension will be the end of the day value attained for coal emissions in $\mu g/m^3$. It generates from the uncontrolled CE_{unc} line (a.).

e. PASS-0 (180) line, with hourly markings in proportion to the hourly K, depicting the controlled emission level when the wind direction is between 180° and 270°T. This line is activated by wind direction inputs and holds the last highest value during periods when the wind is out of quadrant. It's extension represents the near end of day value in $\mu g/m^3$ at station 180-J if no further cycles are applied. This line also generates from the uncontrolled CE_{unc} line (a.).

COLUMN 1. TM Records the hourly values for a 24 hour day, beginning with a 1 at 0100 hours and ending with a 24 at 2400 hours.

COLUMN 2. K Computes and records the hourly value of K as follows:

$$K = ((WS * TEMP) / RH) * (\rho/1.68\mu)$$

COLUMN 3. KD Computes and records the K factor adjusted for rain and freeze effects. KD is used to define the need for a cycle (C_i) administered by the computer controlled water suppression system. KD is computed as follows:

$$KD = K * F_{fr}$$

COLUMN 4. C_i Records the total number of cycles credited on the hour. A 20-minute suppression cycle (35,500 gallons of water) sprayed from the computer controlled water suppression system counts as one cycle as well as a rain event greater than or equal to 0.0225 inches. Rain greater than or equal to 0.01 inches but less than 0.0225 inches is counted as one C_i if the adjusted rain amount for the hour is less than the actual rain amount.

COLUMN 5. SYM Records the type of suppression cycle credited for the hour. Where:

A: represents an ASSURANCE CYCLE (one 20-minute spray cycle per hour from the computer controlled water suppression system).

F: represents a continuous cycle (three 20-minute spray cycles per hour) administered to recover from a freeze event.

R: represents a rain event credited as a cycle.

1: represents a DEMAND I cycle, where KD is greater than or equal to 10, but, less than 15.

2: represents a DEMAND II cycle, where KD is greater than or equal to 15, but, less than 30.

3: represents a DEMAND III cycle, where KD is greater than or equal to 30, but, less than 45.

4: represents a DEMAND IV cycle, where KD is greater than or equal to 45.

COLUMN 6. ΣC_i Records the total number of cycles credited since 0100 or the sum of COLUMN 4.

COLUMN 7. IR Records the amount of rain in inches for the hour as measured by the rain gauge.

NOTE: CIR, the total amount of rain credited for the hour is computed as follows: CIR = IR if it is raining, but adds 0.0225 to IR if a DEMAND 4 RBC is administered. IRadj, the adjusted rain amount for the hour is also computed to include the effects of non-consecutive rains, where:

$$IRadj = CIR_{n-1} / (HRS_{n-1} + 1)$$

when IR > 0 and

HRS > 0

$IRadj = SUMIR_{n-1} / (HRS_{n-1} + 1)$

when IR > 0,

SUMIR $\geq$ 0.0225;

and HRS = 0

IRadj = 0 when IR = 0, and

SUMIR < 0.0225

COLUMN 8. HRS Records the number of hours following a rainfall. HRS increases by one each hour after the rain ends, and continues to do so until another rain begins or until the effects of the rain are over ($F_r \geq 0.9$ or HRS = 48)

NOTE: If a DEMAND 4 cycle is administered in order to recover from a freeze, HRS is initially set to 0.5 instead of 1.

HRS = 0 when C_i = 3 and

FIR_{n-1} = 0 or

$F_{frn-1} < 1$

HRS = 0 when IR > 0 and

SUMIR > 0.0225

HRS = 0.5 when C_i = 3; $FIR_{n-1} > 0$;

and $F_{frn-1} \geq 1$

$HRS = HRS_{n-1} + 1$ when IR > 0 and

SUMIR $\leq$ 0.0225

or

when IR = 0;

SUMIR > 0.0225

NOTE: If TM = 24 and HRS < 48 and F_r < 0.9 then HRS and SUMIR are carried forward to the next day. If HRS = 48 or $F_r \geq 0.9$ the post rain effect has reached its limits. On the next hour, F_r = 1, HRS = 0, and SUMIR = 0.

COLUMN 9. SUMIR Computes and records the effective sum of the hourly rainfall as follows:

SUMIR = 0	when	CIR = 0 and $SUMIR_{n-1} < 0.0225$
$SUMIR = SUMIR_{n-1}$	when	CIR = 0 and $SUMIR_{n-1} \geq 0.0225$
SUMIR = CIR	when	CIR > 0; $(IR + IR_{n-1}) < 0.0225$; and $F_{frn-1} = 1$
SUMIR = CIR	when	CIR > 0; $(IR + IR_{n-1}) < 0.0225$ $F_{frn-1} < 1$; $CIR_{n-1} > 0$; and $C_i = 3$
$SUMIR = IR + SUMIR_{n-1}$	when	CIR > 0' $(IR + IR_{n-1}) < 0.0225$; $F_{frn-1} < 1$; $CIR_{n-1} > 0$; and $C_i < 3$

$SUMIR = IRadj_{n-1} + CIR$ when $CIR > 0$;

$(IR + IR_{n-1}) < 0.0225$

$F_{frn-1} < 1$;

$CIR_{n-1} = 0$;

$SUMIR = IRadj_{n-1} + CIR$ when $CIR > 0$; and

$(IR + IR_{n-1}) \geq 0.0225$

NOTE: If $F_r = 1$ or HRS = 48 then SUMIR is set to zero the next hour.

COLUMN 10. F_r Computes and records the post rain recovery factor. F_r ranges from zero to one, with F_r set to zero during a rain. When $F_r \geq 0.9$, the effects of the rain are considered over, and F_r is set to one on the next hour. F_r is computed as follows:

$F_r = 0$ when $CIR < 0.0225$ and $SUMIR \geq 0.0225$

$F_r = 1$ when $CIR < 0.0225$ and $SUMIR < 0.0225$

$F_r = 10^{(-215.66*24*SUMIR/(HRS*KT))}$ when $CIR < 0.0225$ and $SUMIR < 0.0225$

COLUMN 11. F_{fr} Computes and records the combined effects of rain and freeze, where $F_{fr} = F_r * F_f$.

F_f (the post freeze effect) is calculated as follows:

$F_f = ((SUMKF * FHRS)/(FIR * 106)) * 4.02917 + 0.305$ when FIR > 0 and SUMKF > 0

$F_f = 1$ when FIR = 0 or SUMKF = 0

SUMKF (the sum of the freeze shear) is calculated by summing the K values beginning when the temperature reaches 29 F until $F_r \leq 0.1$ or until continuous cycles are administered.

FIR (the potential freeze water) is calculated as follows:

$FIR = SUMKF/19200$ when $FIR_{n-1} = 0$; SUMIR = 0; FHRS = 8; and SUMKF > 0

$FIR = FIR_{n-1}$ when $FIR_{n-1} = 0$; SUMIR = 0 FHRS ≠ 8 and SUMKF > 0

or

when $FIR_{n-1} > 10$; $F_r = 1$; and $SUMIR + SUMIR_{n-1} \leq FIR_{n-1}$;

FIR = SUMIR for all other conditions

FHRS (the potential freeze hours) is calculated as follows:

FHRS = 0 when SUMIR = 0 and SUMKF = 0

FHRS = HRS when SUMIR > 0 and SUMKF = 0

FHRS = HRS when SUMKF > 0;

TEMP > 34 F; and

F_r < 0.1

FHRS = FHRS + 1 when SUMKF > 0; and

TEMP $\leq$ 34 F or

$F_r \geq 0.1$

COLUMN 12. KT Computes and records the predicted sum of K at the end of the day as follows:

$$KT_n = K_1 + K_2 + K_3 + \ldots K_n + K_n(24\text{-}TM)$$

EXAMPLE:

TM	K
1	10
2	10
3	20

$$KT_3 = 10 + 10 + 20 + 20(24-3) = 460$$

COLUMN 13. H_{vi} Computes and records the estimated amount of dust entering the HVS during the hour as follows:

$$H_{vi} = Ksum * Sl * F_{fr}$$

where:

Ksum is the sum of the K values within the current cycle set.

Sl is the slope of the sumH_{vi} line for the current cycle set, and is computed as follows:

At TM = 1

$Sl = sb$ when $C_i = 0$

where sb(base slope) = CE_{unt}/KT

$Sl = sb * (1\text{-}eff)$ when $C_i > 0$

For all other times (n):

$Sl = Sl_{cin-1} * (1\text{-}eff)_n$

where Sl_{ci-1} is the last value of Sl in the previous C_i sequence Sl_{ci-1} = sb prior to any cycles.

(1-eff) term calculates the efficiency of the last cycle administered and is calculated as follows:

Equation A:

$(1\text{-}eff)_a = (1-(36.657299 * 10^{(-0.00189215 * Ksum)}/100))C_{seq}$

Equation B:

$(1\text{-}eff)_b = (1-((-0.0146913 * Ksum + 14.65059)/100))C_{seq}$

Equation A can be used to calculate the efficiencies when KT < 288 otherwise use Equation B until

$slope_{n-1} * (1\text{-}eff)_b \leq sp$(shift point)

where sp = 0.6256838 - 0.0008297 * KT

then switch to Equation A.

NOTE:At the beginning of the day, (1-eff) = 1 until a cycle occurs. If a cycle is credited at time 1 (cycle performed at TM 0000) then the equation for (1-eff) changes as follows: KT replaces Ksum, and the calculation is multiplied by C_{seq} instead of raised to its power. The slope then remains constant until another cycle/cycles are administered.

C_{seq} is the cycle sequence for the current cycle set.

where: $C_{seq} = 0$ when $C_i = 0$

$C_{seq} = C_{seqn-1}$ when $C_{in} = C_{in-1}$

$C_{seq} = 0.5$ when $C_{in} > C_{in-1}$;

$F_{fr} > 1$;

and $C_i = 1$

$C_{seq} = 1$ when $C_i = 1$ or 3

$C_{seq} = 2$ when $C_i = 2$

EXAMPLE: KT(at TM = 4) = 368.60 i.e. $\geq$ 288

sb = 0.40804

sp = 0.31986

TM	K	RBC	Ksum	(1-eff)	C_{seq}	Sl	F_{fr}	H_{vi}
1	20.10	0	20.10	1.0	0	0.408	1.0	8.2024
2	17.00	0	37.10	1.0	0	0.408	1.0	15.1398
3	16.50	1	16.50	0.85592	1	0.349	1.0	15.7631
4	15.00	1	31.50	0.85592	1	0.350	1.0	11.0307

COLUMN 14. ΣH_{vi} Computes and records the sum of the coal dust in the HVS (Hi Vol Sampler) to the hour as follows:

$$\Sigma H_{vi} = H_{vi} + \Sigma H_{vicin-1}$$

where $\Sigma H_{vicin-1}$ is the last value of ΣH_{vi} in the previous cycle sequence.

EXAMPLE: Using the values from the previous example:

TM	$\Sigma H_{vicin-1}$	ΣH_{vi}
1	0.0	8.2024
2	0.0	15.1398
3	15.1398	20.9029
4	15.1398	26.1705

COLUMN 15. HVT Computes and records the projected amount of dust on the HVS filter at the end of the day if no further cycles were administered.

$HVT = \Sigma H_{vi} + KL * Sl * (1\text{-}eff)$

where $KL = KT - sum(K_1 + K_2 + . . . K_n)$

(1-eff) is the same as COLUMN 14 except that KL is used in the expression instead of Ksum.

COLUMN 16. TEMP Records the temperature in degrees fahrenheit.

COLUMN 17. RH Records the relative humidity (percent)

COLUMN 18. WD Records the wind direction (degrees)

COLUMN 19. WS Records the wind speed (mi/hr)

COLUMN 20. $\#C_c$ Records the number of suppression cycles credited for hour. The suppression cycles are only credited when the wind is blowing within the 180 to 270 degree quadrant.

COLUMN 21. ΣHVIc Computes and records the sum of the dust in the HiVol accumulated when the wind is blowing within the 180 to 270 degree quadrant.

Until such time that the control program display (graph) is installed, programed and functional the following minimum cycle requirements in accordance with the values of "K" will be implemented:

From 0001 to 1200 daily

When the value of "KD" is equal to or greater than 10, Dominion shall commence a full coverage "DEMAND I" water spray suppression cycle of at least 35,500 gallons of water on its respective metallurgical coal piles.

This "DEMAND I" cycling of the suppression water shall be repeated as long as the value of "KD" remains above 10, with one hour delays between cycles. Such times for commencement to be on the hour as dictated by the computed value of "KD."

When the value of "KD" equals or exceeds 15 as computed on the hour, a "DEMAND II" cycle shall commence on all coal piles with no less than 35,500 gallons of water administered on the hour and continue each hour on the hour until the value drops below the value of 15. The normal one hour delay between cycles shall then be resumed as a "DEMAND I" cycle until a value for "KD" is lower than 10.

When the value of "KD" equals or exceeds 30 as computed on the hour, a "DEMAND III" cycle shall commence on all coal piles with no less than 71,000 gallons of water. A "DEMAND III" cycle is defined as a double cycle or a back to back cycle. This endeavor will continue on the hour until the "KD" value drops back below the value of 30. The "DEMAND II" sequence will then commence until the value drops below 15 and subsequently the normal one hour delay between cycles shall then be resumed as a "DEMAND I" cycle until a value for "KD" is less than 10.

When the value of "KD" equals or exceeds 45 as computed on the hour, continuous cycling (DEMAND IV) will commence until the value of "KD" drops below 45, when DEMAND III, II or I shall commence as previously outlined.

From 1201 to 2400 daily

When the value of "KD" is equal to or greater than 11, Dominion shall commence a full coverage "DEMAND I" water spray suppression cycle of at least 35,500 gallons of water on its respective metallurgical coal piles.

This "DEMAND I" cycling of the suppression water shall be repeated as long as the value of "KD" remains above 11, with one hour delays between cycles. Such times for commencement to be on the hour as dictated by the computed value of "KD."

When the value of "KD" equals or exceeds 17 as computed on the hour, a "DEMAND II" cycle shall commence on all coal piles with no less than 35,500 gallons of water administered on the hour and continue each hour on the hour until the value drops below the value of 17. The normal one hour delay between cycles shall then be resumed as a "DEMAND I" cycle until a value for "KD" is lower than 11.

When the value of "KD" equals or exceeds 34 as computed on the hour, a "DEMAND III" cycle shall commence on all coal piles with no less than 71,000 gallons of water. A "DEMAND III" cycle is defined as a double cycle or a back to back cycle. This endeavor will continue until the "KD" value drops below the value of 34. The "DEMAND II" sequence will then commence until the value drops below 17 and subsequently the normal one hour delay between cycles shall then be resumed as a "DEMAND I" cycle until a value for "KD" is lower than 11.

When the value of "KD" equals or exceeds 51 as computed on the hour, continuous cycling (DEMAND IV) will commence until the value of "KD" drops below 51, when DEMAND III, II, or I shall commence as previously outlined.

Each day will have at least four "ASSURANCE" cycles on all metallurgical coal piles regardless of the values of "KD." On days when the hourly values of "KD" are all below 10 prior to 0300, an "ASSURANCE" cycle shall be conducted at that time. If the hourly values of "KD" continue below 10 until 0700, a second "ASSURANCE" cycle shall be conducted at that time. Similarly again at 1100 and 1300. "DEMAND I" cycle requirements or a trace or rain prior to or between 0300 and 1400 shall count as one or more of these four "ASSURANCE" cycles required per day.

OCR

The following pages contain the Optical Character Recognition text of the preceding scanned images.

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WALLACE E. REED, CHAIRMAN T-_
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VICE CHAIRMAN 14:7
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VIRGINIA BEACH co ONWEALTH of VIT3Gj

SAM C. BROWN, JR. artment o A ir Pollution Control A"L, 4. DAVIS
VIED ITIVE.Ja RECTOR
VIRGINIA BEACH 801, NINTH STREET OFFICE BUILDING
RICHARD L. COOK POST OFFICE BOX 10089
RICHMOND RICHMOND, VIRGINIA 23240
(804) 786-2378
MANUEL DEESE
RICHMOND FAX # (804) 225-3933
TDID # (804) 371-8471
November 24, 1987
(Revised January 5, 1990)

Mr. Howard B. Phillips, President
Dominion Terminal Associates
P. U. box 967A
Newport News, VA 23607 . ..... @aA.

Location: Newport News, Virginia
Registration No: 60997
County-Plant No: 2120-0074
Dear mr. Phillips:

Attachea is a revised permit to construct and operate a coal storage and export facility at your terminal in Newport News, Virginia in accordance with the provisions of the Commonwealth of Virginia Regulations for the Control and

Abatement of Air Pollution.

In the course of evaluating the application and arriving at a final decision to approve the project, the Virginia State Air Pollution Control Board (SAPCB)

oeemea the appliCation complete on Novemoer 27, 1989. This revised permit repldces all existing Virginia State Air Pollution Control Board (SAPCB) pen-n its
for this facility.

This approval to construct ana operate shall not relieve Dominion TerTninal Associates of the responsibility to comply with all other local, State and Federal air pollution control regulations.

If you have any questions concerning this permit, please contact the Director, Region VI, at (804) 424-6707.

Sincerely,

AV%
a

Waliace N. Davis
Executive Director
WND/ ER/KLivi/ eOD
Attacnment: Permit

cc: Director, Division of Technical Evaluation Director, Region VI
uirector, Division of Computer Services Old Greenbrier Village, Suite A
2010 Old Greenbrier Road
Chesapeake, VA 23320-2168

An Equal Opportunitv Emp/Qper

DTE-612-89

PERMIT TO CONSTRUCT AND OPERATE

In compliance with the Federal Clean Air Act and the Commonwealth of Virginia Regulations for the Control and Abatement of Air Pollution,

Dominion Terminal Associates
P. 0. Box 967A
Newport News, Virginia 23607
Registration No. 60997
County-Plant No. 2120-0074

is authorized to construct and operate

a coal storage and export facility

located at

Pier 11, Harbor Road
Newport News, Virginia

in accoroance witn the Specific Conditions (emission limitations, monitoring a nd
testing requirements) and the General Conditions set forth in Parts I and II nerein.

Approved this twenty-fourth day of November, 1987 (Revised January 5, 1990).

Wallace N. Daivs
Executive Director

Permit Consists of 21 pages.
Part I - Specific Conditions 1 to 19.
Part II - General Conditions 1 to 16.
Part III - Document List, 6 items.

PART I - SPECIFIC CONDITIONS - the regulatory reference and authority for each condition is listed in parenthesis () after each condition.

1. Dominion Terminal Associates is located in Newport News, Virginia.

2. Construction and operation shall be conducted as proposed in the permit application dated August 17, 1981 and amended on August 25, 1981 and October 19, 1989. The permit application and supporting documents (see Document List) are a part of this permit.
(Section 120-02-11 of State Regulations)

3. The equipment to be installed consists of:

- rotary rail car dumper and other coal handling and storage equipment.

- a permanent wet suppression system which can completely wet all coal storage piles

4. The yearly throughput of coal shall not exceed 20 x 106 tons.
(Section 120-u2-il of State Regulations)

b. The average and maximum quantity of coal in storage at any one time shall not exceed 0.95 x 106 and 1.4 x 106 tons, respectively.
(Section 120-02-11 of State Regulations)

6. Fugitive coal dust emissions from the storage piles shall be controlled by a wet suppression system capable of wetting the entire coal storage area.
(Section 120-08-01 F of State Regulations)

7. Coal dust emissions from the rotary dumper and transfer points shall be controlled by wet suppression which shall include the use of a surfactant. The surfactant to water ratio shall not be less than one gallon surfactant to every 3,500 gallons of water.
(Section 120-08-01 F of State Regulations)

8. Coal dust emissions from the surge silos shall be controlled by baghouses at least 99 percent efficient.
(Section 120-05-04 of State Regulations)

9. Upacity at all emission points shall be limited to less than 5 percent.
(Section 120-02-11 of State Regulations)

10. Dominion Terminal Associates Shall install and operate a PM10 monitor at the Newport News Housing Authority Maintenance Building (180-J) to ascertain the ambient air quality in the area surrounding the coal terminal. Operation shall be in accordance with Appendix J of 40 CFR Part 50.

11. The wet suppression system for the coal storage piles shall be implemented as specified in Appendix A or by any other procedure as may be approved by the Board prior to use. Such approval shall be contingent on adequate documentation that any alternative procedure shall achieve at least as high an efficiency as Appendix A. Requests for changes in procedure shall be accompanied by an explanation of the proposed Changes and the anticipated effect they shall have. These requests, if approved by the State Air Pollution Control Board, shall be subject to a test and evaluation procedure prior to being accepted as permanent changes to the control procedures.
(Section 120-02-11 of State Regulations)

12. Each spray cycle shall attain 100 percent coverage of the coal storage area and shall consist of at least 35,500 gallons of water including assurance cycles.
(Section 120-05-0403 of State Regulations)

i3. One person each shift shall be designated as responsible for compliance with the procedures of Appendix A. Required actions @-, sjp@ort of these procedures shall take precedence over routine coal hatidlinq proceaures.
(Section i2O-O2-11 of State Regulations)

14. Uperating personnel at Dominion Terminal Associates shall be informed of their company's responsibilities under this permit. With respect to compliance with the permit, operating personnel shall be informed by their supervisors that they, as individuals, as well as their employer are responsible for compliance with the conditions of this permit to the extent that their failure to perform their individual duties and responsibilities lead to noncompliance with the conditions of this permit. The following actions are considered as detrimental to the control of coal emissions, but are not limited to:

a. Failure to stop any coal movement operation when it becomes known that installed air pollution control systems are inoperative and would cause excess emissions.

1). Failure to stop a coal movement operation when it becomes known that pieces of coal handling equipment needed for that operation are malfunctioning or operating significantly below designated specifications.

C. Failure of equipment operators to take immediate precautions to preclude fugitive dust emissions from the operation of bull-oozers, front-eno loaders, automobiles or trucks (i.e., through the use of water suppressant to control the dust, or limiting the speed of movement to below 10 miles per hour).

d. Failure of personnel to give precedence to controlling fugitive dust emissions over routine coal operations to personnel designated with the responsibility of controlling fugitive emissions.
(Section 120-02-11 of State Regulations)

15. Whenever Dominion Terminal Associates is using a particular piece of coal handling equipment (e.g. a dumper, a conveyor, etc.), it shall utilize the wet suppression controls for that piece of equipment unless the use of such equipment would cause a safety hazara or damage to the equipment from freezing.
(Section 120-02-11 of State Regulations)

16. Any significant malfunction of equipment that significantly affects the operation of the wet suppression system shall be reported to the State Air Pollution Control Board by telephone as soon as practicable. In the event of such malfunctions, auxiliary watering devices shall be used until such time as the regular equipment is repaired. A log of such action ana corrective action shall be maintained for evaluation o'l lilipact.
12"-"2-11 of State Regulations)

17. All coal storage piles snall oe truncatea and compacted so as to minimize fugitive coal dust emissions.
(Section 120-05-0403 of State Regulations)

18. The representatives of Dominion Terminal Associates shall meet on a regular basis to discuss the implementation of the conditions of this permit.
(Section 120-02-11 of State Regulations)

19. Copies of this permit shall be available for reference at the facility ana operating personnel shall be apprised and trained in the portions of the permit related to their duties and the need to control coal emissions.
(Section 120-02-11 of State Regulations)

PART II GENERAL CONDITIONS

1. Within 10 days after receiving this permit the permittee shall notify the boara (Director, Region VI) in writing of the estimated start-up date of the permitted facility. This notification is for administrative purposes only and need not be a firm date.
(Section 120-02-11 of State Regulations)

2. Quarterly reports on the progress of construction shall be submitted to the Director, Region VI, Deginning December 30, 1989.
(Section 120-02-11 of State Regulations)

3. The permittee Shall furnish written notification to the Board (Director, Region VI) of:

a. The actual date on which construction commenced within 30 days after such date.

b. The anticipated start-up date postmarked not more than 60 days nor less than 30 days prior to such date.

C. The actual start-up date within 15 days after such date.
(Section 120-05-05 of State Regulations)

4. The permitted facility shall be designed and constructed so as to allow emissions testing using the methods prescribed upon reasonable notice at any time.
(Sections 120-05-03 and 120-06-03 of State Regulations)

5. The permittee shall retain records of all emission data and operating parameters required by thp terms of this permit including Appendix A. These records shall be wiailnit@,ined by the source for a period of at least two years. These records shall include coal in storage for each day, and the annual throughput.
(Sections 120-05-05 ana 120-06-05 of State Regulations)

6. All wet suppression equipment operators shall be trained and certified in the proper operation of all such equipment. Dominion Terminal Associates shall maintain records of the required training and certification. Certification of training shall consist of a statEMent of time, place ana nature of training provided.
(Section 120-02-11 of State Regulations)

7. The company shall develop, maintain, and have available to all operators good written operating procedures for all wet suppression equipment. A maintenance schedule for all such equipment shall be established and made available to the State Air Pollution Control Board for review. Recoras of service and maintenance shall be maintained on file by the source for a period of two years.
(Section 120-02-11 of State Regulations)

8. The Boara reserves the right to modify and, if appropriate, to reissue or to rescind this permit if prior to operation there is a substantive change to the design capacity or the fundamental nature of the p--ocess or control equipment such that the potential to emit of any facility is increased.
(Section 120-02-11 of State Regulations)

9. The board reserves the right to modify and, if appropriate, to reissue or to rescind this permit if prior to operation there is a substantive Change in any of the data upon Which the decision to approve this permit was based.
@Section 120-02-11 of State Regulations)

10. All local zoning and building requirements must be met before commencing construction.
(Section 120-02-11 of State Regulations)

11. If, for any reason, the permittee does not comply or shall not be able to Comply with the emission limitations or other conditions specified in this permit, the permittee shall provide in writing to the Board (Director, Region VI) the following information as soon as possible but no later than five days after such conditions become known to the permittee:

a. description of noncompliance;

b. cause of noncompliance;

C. anticipated time the noncompliance is expected to continue or, if corrected, the actual duration of noncompliance;

a. steps taken by the permittee to minimize or eliminate the noncompliance; and

e. steps taken by the permittee to prevent recurrence of the noncompliance.

Submittal of this report does not constitute a waiver of the emission limitations or otner conditions of this permit nor does it in any way restrict the SAPCB's authority to enforce the permit conditions pursuant to Section 113 of the Clean Air Act.
(Section 120-02-11 of State Regulations)

12. The permitted facility is to be constructed and operdted as represented in the permit application referenced in Condition 2 of Part I. No Changes in the permit application specifications or any existing facilities shall be made which alter the emissions into the ambient air or alter the impact of the facility on air quality without the prior written approval ')f the Board.
(Section 120-02-11 of State Regulations)

13. The facility shall operate in compliance with Rules 4-3 and 5-3, Non-Criteria Pollutants. No changes in the facility that cause the emission of additional non-criteria pollutants shall be made without the prior written approval of the Board.
(Sections 120-04-0305 and 120-05-0305 of State Regulations)

14. In the event of any cnange in control of ownership of the permitted source, the permittee Shall notify the succeeding owner of the existence of this permit by letter and send a copy of that letter to Director, Region VI.
(Section 120-02-11 of State Regulations)

i5. The conditions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is helcl invalid, the application of that provision to other circumstances, ana the remainder of this permit, shall not be affectea thereby.
(Section 120-02-11 of State Regulations)

16. This permit approval is only applicable to the permit requirements of the State Air Pollution Control Board and does not alter permit requirements by any other local, state, or federal government agency. Dominion Terminal Associates is cautioned that approval of this permit should not be construed to mean its operation is automatically in coi2oliance with all aspects of the Regulations for the Control and 'W t-ment of Air Pollution. State Air Board personnel shall be constantly evaluating all sources for compliance with Part V, Section 120-05-0103 - Standard for Visible Emissions, Section 120-05-0104 - Standard for Fugitive Dust/Emissions, and Section 120-05-0203 - Standard for Odorous Emissions. Compliance with all air pollution regulations itiust be a continuing, full time effort.
(Section i20-02-11 of State Regulations)

Annual requirements to fulfill legal obligations to maintain current stationary source emissions data shall necessitate your response to requests for information to inclucle, as appropriate: fuel consumption by type, heat value, sulfur ano ash content; process and production data; refuse disposal by incineration including auxiliary fuels burned; storage, handling and use of liquia organic compounds; and, changes in stack data, control equipment, and operating schedules. Such requests for information from the Regional Office shall either be in writing or by personal contact of field enforcement personnel. Emissions (lata provided to the Board by a source must be made available to the public upon request; process data for individual facilities ana plants shall be made available to the publ-ic upon request unless the source claims, in writing, the information is proprietary and that it should be held as confidential.
(Section 120-02-31 of State Regulations)

PART III - DOCUMENT LIST

1. Permit application signed by Mr. F. J. Manusco, dated July 29, 1981.

2. State Air Pollution Control board, Region VI engineering analysis, aatea September 1U, 1981.

3. Mathematical Supplement to: "Control of Fugitive Emissions from Open Coal Storage in Newport News, Virginia," page 67 "Control Methodology."

4. Dominion Terminal Associates letter, dated May 3, 1989 and signed by Mr. Howard B. Phillips.

5. Revised permit application, dated October 19, 1989 and signed by Mr. Thomas N. Houck, P.E.

6. DAPC, Region VI engineering analysis, dated November 22, 1989.

APPENDIX A

This appendix is to be considered a part of the State Air Pollution Control Board permit to operate the Dominion Terminal Associates (Dominion) coal terminal. All procedures outlined in this appendix are enforceable as a condition of operating.

Uominion shall record the following parameters on an hourly basis:

Average hourly temperature (T) in degrees Fahrenheit

Average hourly relative humidity (RH)

Average hourly wind speed in miles per hour (SP)

Average hourly wind direction (DIR)

Hourly rain in inches

Hourly occurrence of fog (visibility of 4 miles or less)

Density of air P from the equation P = -0.0001478(T) + 0.0853

Viscosity of air (1.68u) from the following equations

-24.88 < T < 32 1.68u = 0.0001207(T) + 0.0655479
32.UO < T 64.40 1.68u = 0.0001493(T) + 0.0646353
64.40 < T 104 l.b8u = 0.0001344(T) + 0.0655899

K as determined by the equation: K = SP(T/RH) (P/u 1.68)

Uominion Shall use the data listed above for a computerized spreadsheet in a format as described below, maintaining the records to be submitted to the Boar
d
upon request.

The program outlined in Appendix A when properly programmed will provide for calling up on the hour a visual display (graph) which depicts the following:

a CEunc for the KT predicted: will change by the new hourly prediction of KT. At the end of the day will represent the potential uncontrolled coal emissions experienced in the past 24 hours.

b. Sloge of the uncontrolled intended movement with time for the PASS-1 sustem without controls: will change by the new hourly prediciton of KT.

C. PASS-1 line, with hourly markings in proportion depicting the controlled to the hourly K. emission level attained when controls are applied. This line's slope and value will vary as suppression cycles are applied. The extension of this line depicts the near low end of the day value in ;,g/m3, if no further cycles are applied and is the primary control medium. It generates from the uncontrolled slope line (b.).

d. PASS-0 line, depicting the controlled emissions level attained when controls are apglied. This line's slope as in (c) will vary as suppression cycles are applied. The extension of this line depicts the near high end of the day value in gg/m3, if no further cycles are applied. When, due to cycles. the PASS-0 line and thp PASS-1 line are one and the same, their extension will be the end of the day value attained for coal emissions in gg/m^3 It generates from the uncontrol 1 ed CEunc 1 i ne (a.) .

e. PASS-0 (180) line, with hourly markings in proportion to the hourly K. depicting the controlled emission level when the wind direction is between 1800 and 2700T. This line is activated by wind direction inputs and holds the last highest value during periods when the wind is out of quadrant. It's extension represents the near end of day value in ,&g/m3at station 180-J if no further cycles are applied. This line also generates from the uncontrolled CEunc line (a.).

COLUMN 1. TM Records the hourly values for a 24 hour day, beginning with a I at 0100 hours and ending with a 24 at 2400 hours.

COLUMN 2. K Computes and records the hourly value of K as follows:
K = ((WS * TEMP) / RH) * (p/1.68g)

COLUMN 3. KD Computes and records the K factor adjusted for rain and freeze effects. KD is used to define the need for a cycle (Ci) administered by the computer controlled water suppression system. KD is computed as follows:
KD = K * Ffr

COLUMN 4. Ci Records the total number of cycles credited on the hour. A 20-minute suppression cycle (35,500 gallons of water) sprayed from the computer controlled water suppression system counts as one cycle as well as a rain event greater than or equal to 0.0225 inches. Rain greater than or equal to 0.01 inches but less than 0.0225 inches is counted as one Ci if the adjusted rain amount for the hour is less than the actual rain amount.

COLUMN 5. SYM Records the type of suppression cycle credited for the hour. Where:
represents an ASSURANCE CYCLE (one 20-minute spray cycle per hour from the computer controlled water suppression system).

F: represents a continuous cycle (three 20-minute spray cycles per hour) administered to recover from a freeze event.

R: represents a rain event credited as a cycle.

1: represents a DEMAND I cycle, where KD is greater than or equal to 10, but, less than 15.

2: represents a DEMAND II cycle, where KD is greater than or equal to 15, but, less than 30.

3: represents a DEMAND III cycle, where KD is greater than or equal to 30, but, less than 45.

4: represents a DEMAND IV cycle, where KD is greater Lildn or equal to 45.

COLUMN 6. zCi Records the total number of cycles credited since 0100 or the sum of COLUMN 4.

COLUMN 7. IR Records the amount of rain in inches for the hour as measured by the rain gauge.

NOTE: CIR, the total amount of rain credited for the hour is computed as follows: CIR = IR if it is raining, but adds 0.0225 to IR if a DEMAND 4 RBC is administered.

IRadj, the adjusted rain amount for the hour is also computed to include the effects of non-consecutive

s

IRadj CIRn-1 / (HRSn-1 + 1)

when IR > 0 and

HRS > 0

IRadj = SUMIRn-1 (HRSn-1 + 1)

when IR > 0,

SUMIR > 0.0225;

and HRS = 0

IRadj = 0 when IR = 0, and

SUMIR < 0.0225

COLUMN 8. HRS Records the number of hours following a rainfall. HRS increases by one each hour after the rain ends, and continues to do so until another rain begins or until the effects of the rain are over (Fr > 0-9 or HRS = 48)

NOTE: If a DEMAND 4 cycle is administered in order to recover from a freeze, HRS is initially set to 0.5 instead of 1.

HRS = 0 when C 3 and

FIRn-1 @ 0 or

Ffrn-1 < 1

HRS = 0 when IR > 0 and

SUMIR > 0.0225

HRS = 0.5 when Ci = 3; FIRn-1 > 0;

and Ffrn-1 > 1

HRS = HRSn-1 + 1 when IR > 0 and

SUMIR < 0.0225

or

when IR = 0;

SUMIR > 0.0225

NOTE: If TM 24 and HRS < 48 and Fr < 0.9 then HRS

and SUMIR are carried forward to the next day.

If HRS = 48 or Fr > 0.9 the post rain effect has

reached its limits. On the next hour, Fr = 1,

HRS = 0, and SUMIR = 0.

COLUMN 9. SUMIR Computes and records the effective sum of the hourly

rainfall as follows:

SUMIR = 0 when CIR = 0 and

SUMIRn-1 < 0.0225

SUMIR = SUMIRn-1 when CIR = 0 and

SUMIRn-1 > 0.0225

SUMIR = CIR when CIR > 0;

(IR + IRn-1) < 0.0225;

and Ffrn-1 = 1

SUMIR = CIR when CIR > 0;

(IR + IRn-1) < 0.0225

Ffrn-1 < 1;

CIRn-1 > 0; and

Ci = 3

SUMIR IR + SUMIRn-1 when CIR > O'

(IR + IRn-1) < 0.0225;

Ffrn-1 < 1;

CID > 0
 ."_1 7, .-

Ci < 3

SUMIR = IRadin-1 + CIR when CIR > 0;

(IR + IRn-1) < 0.0225

Ffrn-1 < 1;

CIRn-1 = 0;

SUMIR = IRadin-1 + CIR when CIR > 0; and

(IR + IRn-1) > 0.0225

NOTE: If Fr = 1 or HRS = 48 then SUMIR is set to zero the

next hour.

COLUMN 10. Fr Computes and records the post rain recovery factor. Fr

ranges from zero to one, with Fr set to zero during a rain.

When Fr > 0.9, the z'11-ects of the rain are considered over,

and Fr is set to one on the next hour. Fr is computed as

follows:

F = 0 when CIR < 0.0225 and
r

SUMIR > 0.0225

Fr = 1 when CIR < 0.0225 and

SUMIR < 0.0225

Fr = lo(-215.66*24*SUMIR/(HRS*KT))

when CIR < 0.0225 and

SUMIR < 0.0225

COLUMN 11. Ffr Computes and records the combined effects of rain and

freeze, where Ff,.- ": Fr * Ff I

Ff (the post freeze effect) is calculated as follows:

Ff - ((SUMKF FHRS)/(FIR * 106)) * 4.02917 + 0.305

when FIR > 0 and SUMKF > 0

Ff = 1 when FIR = 0 or SUMKF = 0

SUMKF (the sum of the freeze shear) is calculated by summing the K values beginning when the temperature reaches 29 F until Fr < 0-1 or until continuous cycles are administered.

FIR (the potential freeze water) is calculated as follows:

FIR = SUMKF/19200 when FIRn-1 ' 0;

SUMIR = 0;

FHRS = 8; and

> 0

FIR = FIRn-1 when FIRn-1 = 0;

SUMIR = 0

FHRS @ 8 and

SUMKF > 0

or

when FIRn-1 > 10;

Fr = 1; and

SUMIR + SUMIRn-1 < FIRn-1;

FIR = SUMIR for all other conditions

FHRS (the potential freeze hours) is calculated as follows:

4@@-n "'I'UTP n
FHRS = 0

SUMKF 0

FHRS = HRS when SUMIR > 0 and

SUMKF = 0

FHRS = HRS when SUMKF > 0;

TEMP > 34 F; and

Fr < 0.1

FHRS = FHRS + 1 when SUMKF > 0; and

TEMP < 34 F or

Fr > 0.1

COLUMN 12. KT Computes and records the predicted sum of K at the end of the day as follows:

KTn = Ki + K2 + K3 + Kn + Kn(24-TM)

EXAMPLE: TM K

1 10

2 10

3 20

KT3 = 10 + 10 + 20 + 20(24-3) = 460

COLUMN 13. HO Computes and records the estimated amount of dust entering the HVS during the hour as follows:

Ho = Ksum * SI * Ffr

where:

Ksum is the sum of the K values within the current cycle set.

SI is the slope of the sumHvi line for the current c3l,cle set, and is computed as follows:

At TM = I

Si = sb when Ci = 0

where sb(base slope) CEunt/KT

Si = sb * (I-eff) when Ci > 0

For all other times (n):

Si = Sicin-1 * (I-effln

where SlCi-1 is the last value of Si in the previous Ci

sequence SlCi-1 = sb prior to any cycles.

(1-eff) term calculates the efficiency of the last

cycle administered and is calculated as follows:

Equation A:

I - io(-0.00189215 * Ks
G (1-(36.657299 um)/100))c
seq

Equation B:

(1-eff)b = (1-((-0.0146913 * Ksum + 14.65059)/100))Cseq

Equation A can be used to calculate the efficiencies

when KT < 288 otherwise use Equation B until

slopen-1 (1-eff)b < sp(shift point)

where sp 0.6256838 - 0.0008297 * KT

then switch to Equation A.

NOTE:At the beginning of the day, (I-eff) = 1 until a

cycle occurs. If a cycle is credited at time 1 (cycle

performed at TM 0000) then the equation for (I-eff)

changes as follows: KT replaces Ksum, and the

multiplied by C instead of raise'- '.13
seq

its power. The slope then remains constant until

another cycle/cycles are administered.

Cseq is the cycle sequence for the current cycle set.

where: Cseq 0 when Ci 0

C C when C
seq seqn-1 i n Cin-1

Cseq 0. 5 when Cin > Cin-1;

Ffr > 1;

and Ci = 1

Cseq I when Ci = 1 or 3

Cseq 2 when Ci = 2

EXAMPLE: KT(at TM 4) = 368.60 i.e. > 288

sb = 0.40804

sp = 0.31986

TM	K	RBC	Ksum	(I-eff)	Cseq	Si	Ffr	HO
1	20.10	0	20.10	1.0	0	0.408	1.0	8.2024
2	17.00	0	37.10	1.0	0	0.408	1.0	15.1398
3	16.50	1	16.50	0.85592	1	0.349	1.0	15.7631
4	15.00	1	31.50	0.85592	1	0.350	1.0	11.0307

COLUMN 14. zHvi Computes and records the sum of the coal dust in the HVS (Hi Vol Sampler) to the hour as follows:

z:Hvi = HO + EHvicin-1

where EHvicin-1 is the last value of EHVi in the previous cycle sequence.

EXAMPLE: Using the values from the previous

example:

TM EHvicin-1 EHVi

I 0.0 8.2024

2 0.0 15.1398

3 15.1398 20.9029

4 15.1398 26.1705

COLUMN 15. HVT Computes and records the projected amount of dust on the HVS filter at the end of the day if no further cycles were administered.

HVT = EHVi + KL Sl (1-eff)

where KL KT sum(Ki + K2 + Kn)

(1-eff) is the same as COLUMN 14 except that KL is used in the expression instead of Ksum.

COLUMN 16. TEMP Records the temperature in degrees fahrenheit.

COLUMN 17. RH Records the relative humidity (percent)

COLUMN 18. WD Records the wind direction (degrees)

COLUMN 19. WS Records the wind speed (mi/hr)

COLUMN 20. #Cc Records the number of suppression cycles credited for hour. The suppression cycles are only credited when the wind is blowing within the 180 to 270 degree quadrant.

COLUMN 21. zHVIc Computes and records the sum of the dust in the HiVol accumulated when the wind is blowing within the 180 to 270 degree quadrant.

Until such time that the control program display (graph) is installed, programed and functional the following minimum cycle requirements in accordance with the values of "K" will be implemented:

From 0001 to 1200 daily

When the value of "KD" is equal to or greater than 10, Dominion shall commence a full coverage "DEMAND I" water spray suppression cycle of at least 35,500 gallons of water on its respective metallurgical coal piles.

This "DEMAND III c ling of the suppression water shall be repeated as long as the value of 113c" remains above 10, with one hour delays between cycles. Such times for commencement to be on the hour as dictated by the computed value of "O."

When the value of "KD" equals or exceeds 15 as computed on the hour, a "DEMAND H" cycle shall commence on all coal piles with no less than 35,500 gallons of water administered on the hour and continue each hour on the hour until the value drops below the value of 15. The normal one hour delay between cycles shall then be resumed as a "DEMAND I" cycle until a value for "KD" is lower than 10.

When the value of "Kr)" enun'!, rgs2eds 30 as computed on the hour, a "DEMAND III" cycle shall commence on all coal piles with no less than 71,000 gallons of water. A "DEMAND III" cycle is defined as a double cycle or a back

to back cycle. This endeavor will continue on the hour until the "KD" value drops back below the value of 30. The "DEMAND IF' sequence will then commence

until the value drops below 15 and subsequently the normal one hour delay between cycles shall then be resumed as a "DEMAND I" cycle until a value for I1KDII is less than 10.

When the value of "KD" equals or exceeds 45 as computed on the hour, continuous cycling (DEMAND IV) will commence until the value of "KY drops below 45, when DEMAND III, II or I shall commence as previously outlined.

From 1201 to 2400 daily

When the value of "KD" is equal to or greater than 11, Dominion shall commence a full coverage "DEMAND I" water spray suppression cycle of at least 35,500 gallons of water on its respective metallurgical coal piles.

This "DEMAND I" cycling of the suppression water shall be repeated as long as the value of "KD" remains above 11, with one hour delays between cycles. Such times for commencement to be on the hour as dictated by the computed value of "O."

When the value of IIKD" equals or exceeds 17 as computed on the hour, a "DEMAND H" cycle shall commence on all coal piles with no less than 35,500 gallons of water administered on the hour and continue each hour on the hour until the value drops below the value of 17. The normal one hour delay between cycles shall then be resumed as a "DEMAND I" cycle until a value for 1IKDII is lower than 11.

When the value of 11KD" equals or exceeds 34 as computed on the hour, a "DEMAND IIIN cycle shall commence on all coal piles with no less than 71,000 gallons of water. A 'DEMAND III" cycle is defined as a double cycle or a back

to back cycle. This endeavor will continue until the 'KD" value drops below the value of 34. The "DEMAND II" sequence will then commence until the value drops below 17 and subsequently the normal one hour delay between cycles shall

then be resumed as a "DEMAND I" cycle until a value for 11KD" is lower than 11 .

When the value of 11KD' equals or exceeds 51 as computed on the hour, continuous cycling (DEMAND IV) will commence until the value of "KD" drops below 51, when DEMAND III, II, or I shall commence as previously outlined.

Each day will have at least four "ASSURANCE" cycles on all metallurgical coal piles regardless of the values of 110.11 On days when the hourly values of 11KD11 are all below 10 prior to 0300, an "ASSURANCE' cycle shall be conducted at that time. If the hourly values of "KD" continue below 10 until 0700, a second "ASSURANCE" cycle shall be conducted at that time. Similarly again at 1100 and 1300. "DEMAND I" cycle requirements or a trace or rain prior to or between 0300 and 1400 shall count as one or more of these four "ASSURANCE" cycles required per day.