

## **Adendo ao Apêndice F**

**Relatório do Painel de Especialistas sobre as Causas Técnicas do rompimento da Barragem  
I do Córrego do Feijão  
Adendo ao Apêndice F**

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**ÍNDICE**

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## **1. INTRODUÇÃO**

Este Adendo ao Apêndice F do Relatório do Painel de Especialistas sobre as Causas Técnicas da Ruptura da Barragem do Córrego do Feijão I ("Relatório do Painel de Especialistas") foi preparado pelo Painel de Especialistas a pedido da Vale S.A.<sup>1</sup>

Conforme relatado no Relatório do Painel de Especialistas, em conexão com o desenvolvimento do modelo computacional 3D da Barragem I, o Painel de Especialistas revisou e considerou aproximadamente 28 imagens de satélite da Barragem do Córrego do Feijão B-I ("Barragem I") tiradas durante os períodos de 1987 e 1998-2016 (*Consulte* Relatório do Painel de Especialistas, Apêndice F, Seções 1 e 3.5, e Anexo 2). Após a publicação do Relatório do Painel de Especialistas, o Painel soube da existência de imagens de satélite adicionais da Barragem I e solicitou a revisão e análise dessas imagens pela Klohn Crippen Berger Ltd. ("KCB"). O objetivo do Painel de Especialistas ao examinar essas imagens adicionais era avaliar se qualquer informação relevante sobre a Barragem I poderia ser obtida a partir dessas imagens de satélite adicionais e determinar se elas se alinhavam com as informações que usadas pela KCB no desenvolvimento do modelo computacional 3D da Barragem I, ou se ajustes ou modificações desse modelo computacional seriam necessários.

Noventa e três imagens de satélite do período de 1967 a 2005 foram baixadas e adaptadas para uma forma utilizável pela Geoapp srl ("Geoapp"). Uma dessas imagens de satélite era uma imagem de satélite desclassificada da Keyhole de 1967, anterior à construção da barragem, e outra era uma imagem desclassificada de satélite da Keyhole de 1977, logo após a construção inicial da barragem. As 91 imagens de satélite restantes eram de satélites Landsat e várias fotos estavam disponíveis para cada ano durante o período de 1984 a 2005. Uma lista de todas as imagens de satélite analisadas pelo Painel está disponível na Tabela 1.

A KCB revisou e analisou essas 93 imagens de satélite adicionais da mesma maneira que analisou as 28 imagens de satélite anteriormente consideradas, conforme descrito no Apêndice F. O Painel de Especialistas supervisionou e levou em consideração a análise realizada pela KCB. Após a conclusão da análise, o Painel de especialistas concluiu que nenhum ajuste ou modificação no modelo computacional 3D da Barragem I era necessário e que as conclusões originais do Painel de especialistas sobre as causas técnicas da falha da Barragem I permaneceram inalteradas. A análise das imagens de satélite adicionais segue abaixo.

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1 Detalhes sobre o Painel de especialistas e seu mandato podem ser encontrados na página 1 do Laudo Pericial e/ou no site [www.b1technicalinvestigation.com](http://www.b1technicalinvestigation.com).

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## 2. FERRAMENTAS E FONTES DE DADOS

A imagem desclassificada do satélite Keyhole de 1967 não foi incluída nesta avaliação porque é anterior à construção da barragem. A imagem do satélite Keyhole de 1977 foi analisada, mas não foi utilizada para extrair detalhes geométricos da instalação de rejeitos porque a qualidade da imagem era baixa. As 91 imagens de satélite restantes, obtidas dos satélites Landsat, foram analisadas como parte desta avaliação. As imagens analisadas são apresentadas na Tabela 1.

**Tabela 1:** Resumo de 93 imagens de satélite

| <b>Etapa</b> | <b>Crista da Barragem El. (m)</b> | <b>Imagens de satélite</b>                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                      |
|--------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1            | 874.0                             | (2) 1977                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                      |
| 2            | 877.0                             | -                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                      |
| 3            | 879.0                             | -                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                      |
| 4            | 884.0                             | (3) 19 de abril de 1984<br>(6) 24 de julho de 1984<br>(9) 17 de fevereiro de 1985<br>(12) 25 de junho de 1985                                                                                                                                                                                                                                          | (4) 6 de junho de 1984<br>(7) 9 de agosto de 1984<br>(10) 22 de abril de 1985<br>(13) 12 de agosto de 1985                                                                                                                                                                                                                                                 | (5) 8 de julho de 1984<br>(8) 1 de fevereiro de 1985<br>(11) 8 de maio de 1985<br>(14) 28 de agosto de 1985                                                                                                                                                                                                                                          |
| 5            | 889.0                             | (15) 3 de janeiro de 1986<br>(18) 14 de julho de 1986<br>(21) 16 de setembro de 1986<br>(24) 3 de novembro de 1986<br>(27) 15 de junho de 1987<br>(30) 2 de agosto de 1987<br>(33) 5 de outubro de 1987<br>(36) 29 de março de 1988<br>(39) 17 de junho de 1988<br>(42) 21 de setembro de 1988<br>(45) 19 de maio de 1989<br>(48) 23 de agosto de 1989 | (16) 20 de fevereiro de 1986<br>(19) 15 de agosto de 1986<br>(22) 2 de outubro de 1986<br>(25) 7 de fevereiro de 1987<br>(28) 1 de julho de 1987<br>(31) 3 de setembro de 1987<br>(34) 22 de novembro de 1987<br>(37) 30 de abril de 1988<br>(40) 19 de julho de 1988<br>(43) 1 de abril de 1989<br>(46) 4 de junho de 1989<br>(49) 24 de setembro de 1989 | (17) 27 de maio de 1986<br>(20) 31 de agosto de 1986<br>(23) 18 de outubro de 1986<br>(26) 28 de abril de 1987<br>(29) 17 de julho de 1987<br>(32) 19 de setembro de 1987<br>(35) 25 de janeiro de 1988<br>(38) 16 de maio de 1988<br>(41) 4 de agosto de 1988<br>(44) 17 de abril de 1989<br>(47) 20 de junho de 1989<br>(50) 26 de outubro de 1989 |
| 6            | 891.5                             | (51) 3 de março de 1990<br>(54) 25 de julho de 1990<br>(57) 27 de setembro de 1990                                                                                                                                                                                                                                                                     | (52) 4 de abril de 1990<br>(55) 26 de agosto de 1990                                                                                                                                                                                                                                                                                                       | (53) 9 de julho de 1990<br>(56) 11 de setembro de 1990                                                                                                                                                                                                                                                                                               |
| 7            | 895.0                             | (58) 1 de janeiro de 1991<br>(61) 30 de julho de 1992                                                                                                                                                                                                                                                                                                  | (59) 7 de abril de 1991<br>(62) 31 de agosto de 1992                                                                                                                                                                                                                                                                                                       | (60) 12 de julho de 1991                                                                                                                                                                                                                                                                                                                             |
| 8            | 899.0                             | (63) 27 de março de 1993<br>(66) 19 de setembro de 1993<br>(69) 10 de fevereiro de 1994<br>(72) 18 de junho de 1994                                                                                                                                                                                                                                    | (64) 28 de abril de 1993<br>(67) 6 de novembro de 1993<br>(70) 1 de maio de 1994<br>(73) 5 de agosto de 1994                                                                                                                                                                                                                                               | (65) 18 de agosto de 1993<br>(68) 8 de dezembro de 1993<br>(71) 2 de junho de 1994<br>(74) 22 de setembro de 1994                                                                                                                                                                                                                                    |
| 9            | 905.0                             | (75) 7 de julho de 1995<br>(78) 28 de julho de 1997                                                                                                                                                                                                                                                                                                    | (76) 7 de junho de 1996                                                                                                                                                                                                                                                                                                                                    | (77) 26 de agosto de 1996                                                                                                                                                                                                                                                                                                                            |
| 10           | 910.0                             | (79) 16 de agosto de 1998<br>(82) 22 de setembro de 2000                                                                                                                                                                                                                                                                                               | (80) 19 de agosto de 1999<br>(83) 18 de abril de 2001                                                                                                                                                                                                                                                                                                      | (81) 21 de agosto de 2000<br>(84) 9 de setembro de 2001                                                                                                                                                                                                                                                                                              |
| 11           | 916.5                             | (85) 21 de abril de 2002                                                                                                                                                                                                                                                                                                                               | (86) 26 de julho de 2002                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                      |
| 12           | 922.5                             | (87) 14 de agosto de 2003                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                      |
| 13           | 929.5                             | (88) 31 de julho de 2004<br>(91) 24 de fevereiro de 2005                                                                                                                                                                                                                                                                                               | (89) 16 de agosto de 2004<br>(92) 13 de abril de 2005                                                                                                                                                                                                                                                                                                      | (90) 6 de dezembro de 2004<br>(93) 19 de agosto de 2005                                                                                                                                                                                                                                                                                              |



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|    |       |   |
|----|-------|---|
| 14 | 937.0 | - |
| 15 | 942.0 | - |

Nota(s) 1. Imagem 1 (1967) não analisada como parte da avaliação complementar de imagem de satélite porque é anterior à construção da barragem.

As imagens de satélite foram compiladas e analisadas usando um software de desenho assistido por computador (CAD). As imagens de satélite foram definidas para a projeção e datum listados em Tabela 2.

**Tabela 2:** Resumo de projeção e datum

| Item     | Descrição                           |
|----------|-------------------------------------|
| Projeção | Universal Transverse Mercator (UTM) |
| Zona     | 23S                                 |
| Datum    | SIRGAS2000                          |

### **3. ANÁLISE DE IMAGEM DE SATÉLITE**

As imagens de satélite adicionais foram analisadas com a intenção de verificar e atualizar, quando necessário, a distância entre a crista da barragem e o reservatório na Barragem I em cada estágio de construção (denominado "limite do lago de decantação "). Para auxiliar na análise, o AutoCAD Civil 3D 2018™ (Civil 3D) foi usado como um repositório central para importar as imagens de satélite para análise e interpretação. Esta análise incluiu a estimativa do limite do lago de decantação para cada imagem de satélite, conforme mostrado no Anexo I. O limite que separa os rejeitos finos e grossos é referido aqui como "limite das lamas". O processo usado na avaliação original foi definir este limite entre lama e rejeitos finos e grossos usando um offset a partir do limite do lago de decantação. Esse offset foi estabelecido com base na distância a montante do limite do limite do lago de decantação em que os testes de penetração de cone (CPTs) mostraram evidências de lama; na avaliação original, determinou-se que apenas os ensaios de CPTs mais a montante mostraram evidências de lama e que aqueles realizados no talude da barragem não mostraram evidências de lama. Com base nisso, o limite de lamas foi posicionado entre esses CPTs na avaliação original.

O offset entre o limite do reservatório e o limite das lamas na avaliação original foi usado com o limite do lago de decantação atualizado na avaliação atual para determinar um limite de lamas atualizado. O limite das lamas atualizado na avaliação atual também foi verificado quanto à consistência com os CPTs que mostraram lamas e aqueles que não mostraram.

Usando o limite atualizado do reservatório, foi determinada uma estimativa do comprimento da praia para cada imagem de satélite. Como cada estágio de construção durou vários anos, várias imagens de satélite estavam disponíveis para um único estágio de construção.

# Relatório do Painel de Especialistas sobre as Causas Técnicas do rompimento da Barragem I do Córrego do Feijão

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Cada imagem de satélite tinha um comprimento de praia diferente; portanto, a média dos comprimentos de praia medidos para uma determinada fase de construção foi usada para calcular o comprimento médio da praia para essa fase. Usando as estimativas de comprimento de praia de cada imagem de satélite, em combinação com os dados coletados das 28 imagens de satélite originais, as superfícies de elevação tridimensionais do reservatório para cada estágio de construção foram modeladas em Civil 3D. Um resumo das elevações revisadas do reservatório é apresentado na Tabela 3.

**Tabela 3:** Resumo das elevações do reservatório

| Etapa | Crista da Barragem El. (m) | Reservatório El. (m)   | Etapa | Crista da Barragem El. (m) | Reservatório El. (m)   |
|-------|----------------------------|------------------------|-------|----------------------------|------------------------|
| 1     | 874.0                      | 870.2                  | 9     | 905.0                      | 899.9                  |
| 2     | 877.0                      | 873.2                  | 10    | 910.0                      | 904.5 ( <b>904.9</b> ) |
| 3     | 879.0                      | 876.2                  | 11    | 916.5                      | 910.6 ( <b>910.1</b> ) |
| 4     | 884.0                      | 880.8 ( <b>880.0</b> ) | 12    | 922.5                      | 917.3 ( <b>917.6</b> ) |
| 5     | 889.0                      | 885.8 ( <b>885.1</b> ) | 13    | 929.5                      | 924.9 ( <b>924.5</b> ) |
| 6     | 891.5                      | 887.9 ( <b>887.2</b> ) | 14    | 937.0                      | 931.9                  |
| 7     | 895.0                      | 891.1 ( <b>890.5</b> ) | 15    | 942.0                      | 936.2                  |
| 8     | 899.0                      | 895.1 ( <b>894.6</b> ) |       |                            |                        |

Nota(s) 1. As elevações do reservatório resumidas no Apêndice F mostradas em negrito foram atualizadas como parte da avaliação complementar da imagem de satélite.

Uma superfície revisada do limite do lago de decantação, representando a interseção entre o lago de decantação e a praia, foi criada para toda a altura da Barragem I. Este limite é apresentado nas três seções transversais usadas na avaliação original (denominadas 1-1', 2-2' e 3-3' - *Vide* Figura 1) na Figura 2. O limite das lammas também foi atualizado para refletir o limite atualizado do lago de decantação, conforme discutido acima.

Os resultados da análise da imagem de satélite indicam que o limite revisado do lago de decantação é geralmente compatível com o limite original próximo da ombreira direita (*Vide* Seção 1-1' nas Figuras 1 e 2). Em direção à ombreira esquerda, o limite do lago de decantação foi observado até 50 m mais perto da crista da barragem nas fases iniciais de construção (*Vide* Seção 3-3' nas Figuras 1 e 2). Como o limite das lammas é baseado em um deslocamento constante do limite do reservatório, esta atualização também move o limite das lammas aproximadamente 50 m a jusante na área da ombreira esquerda. Os limites modelados do lago de decantação e lammas para cada estágio de construção são mostrados nas imagens de satélite no Anexo I.

As imagens aéreas e de satélite não foram usadas para delinear rejeitos a jusante do limite das lammas em tipos semelhantes de rejeitos (ou seja, rejeitos finos e grossos) ou para determinar os limites entre esses materiais. Esse delineamento foi baseado nos dados de ensaios de CPT na avaliação original e não é afetado pela interpretação dessas imagens de satélite adicionais. O

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delineamento entre esses materiais usados nas análises originais é mostrado na Figura 3, que também mostra os limites revisados do lago de decantação e das lamas.

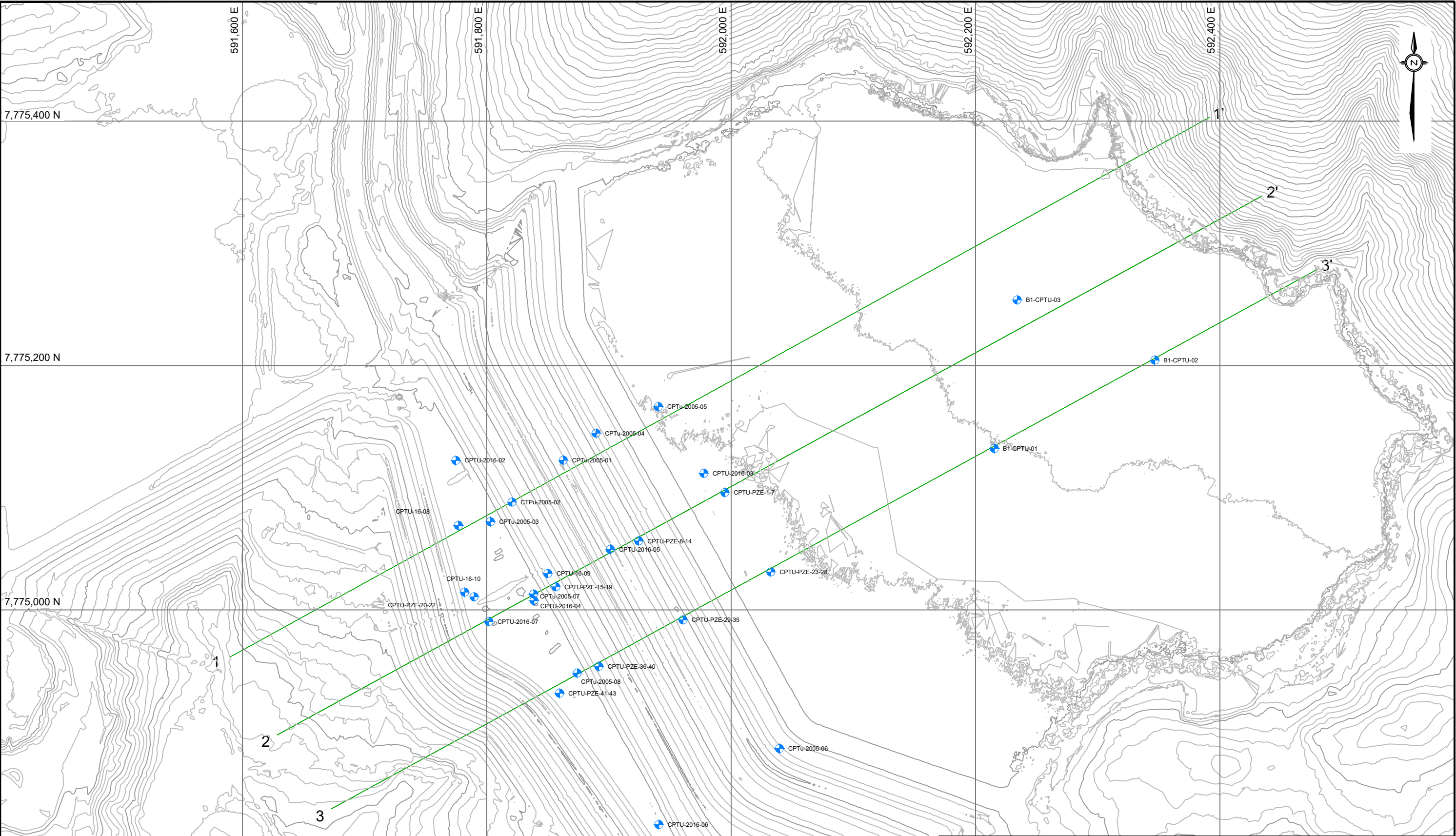
Os dados de ensaios de CPT usados para delinear os rejeitos finos e grossos foram concentrados em torno das três seções transversais mostradas na Figura 1. Na avaliação original, os dados interpretados nessas seções foram projetados para as ombreiras em uma direção normal às linhas de seção. A direção desta projeção foi comparada com as imagens aéreas na avaliação original. Verificações semelhantes foram concluídas nesta análise complementar e foram consideradas compatíveis.

#### **4. RELEVÂNCIA DOS DADOS ADICIONAIS**

Após esta análise, o Painel de Especialistas concluiu que ajustes para os limites do lago de decantação e das lamas para os estágios iniciais de construção não teriam um efeito significativo no resultado da investigação e que uma atualização da modelagem numérica não é necessária. As principais razões para esta conclusão são:

- Os ajustes no limite do lago de decantação não afetariam a delimitação entre rejeitos finos e grossos porque este limite foi baseado em dados de ensaios de CPT. Conforme discutido anteriormente, as interpretações de ensaios de CPT foram feitas nas seções transversais mostradas na Figura 2 e extrapoladas para as ombreiras. As imagens aéreas adicionais corroboram a extrapolação dos limites entre esses tipos de rejeitos para as ombreiras porque as condições nelas eram tipicamente semelhantes às das seções transversais mais próximas.
- O limite revisado do lago de decantação para os primeiros anos de construção não teria um efeito significativo na resposta geral dos modelos numéricos porque não alteraria o delineamento das camadas de rejeitos finos e grossos. Pela mesma razão, a calibração dos modelos de percolação foi mais fortemente influenciada por dados dos últimos anos de construção, o impacto geral dessas imagens de satélite adicionais também seria mínimo.
- O limite das lamas atualizado está muito a montante para ter um efeito significativo nos resultados da modelagem de deformação. As análises de deformação mostraram que as principais concentrações de tensões ocorreram abaixo do talude da barragem. Pode-se inferir das imagens aéreas atuais que as lamas estavam localizadas a montante daquela região com base na abordagem usada na análise original de estabelecer o limite das lamas aproximadamente 115 m a montante do limite do lago de decantação. Este limite estimado das lamas é corroborado pelos dados dos ensaios CPT.

## **Figuras**



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.

**LEGEND:**

- DESIGN SECTIONS
- CPTu LOCATION
- 2 m CONTOURS (JUNE 2018 TOPOGRAPHIC SURVEY)
- 10 m CONTOURS (JUNE 2018 TOPOGRAPHIC SURVEY)

1:3,000

0 30 60 m

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

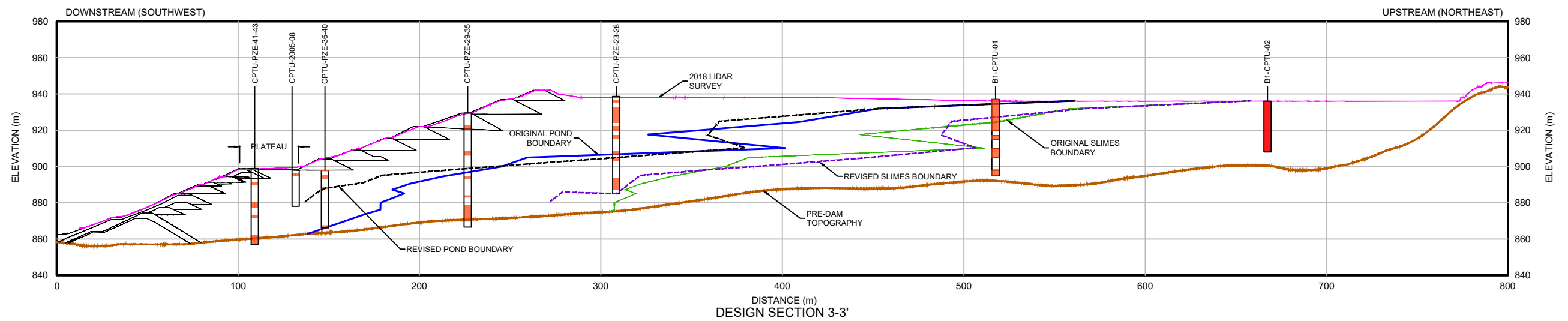
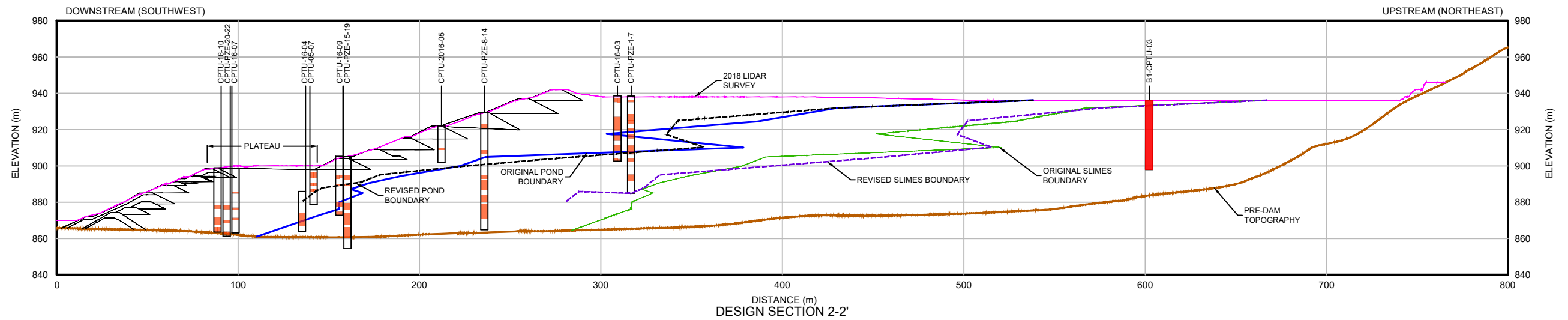
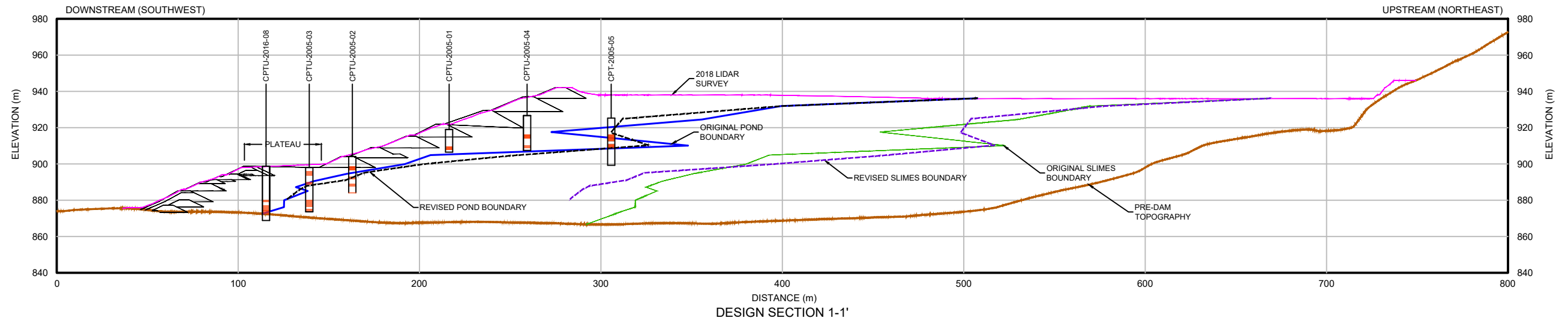
TITLE

**DAM 1 DESIGN SECTION LOCATIONS  
PLAN VIEW**

SCALE  
1:3,000

PROJECT No.  
A03355A02

FIG. No.  
FIGURE 1



#### NOTES:

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.

#### LEGEND:

- PRE-DAM TOPOGRAPHY
- 2018 LIDAR SURVEY
- CONTAINMENT BERMS
- ORIGINAL POND BOUNDARY
- ORIGINAL SLIMES BOUNDARY
- REVISED POND BOUNDARY
- REVISED SLIMES BOUNDARY
- FINE TAILINGS
- SLIMES

1:2,500 0 25 50 m

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT  
TITLE

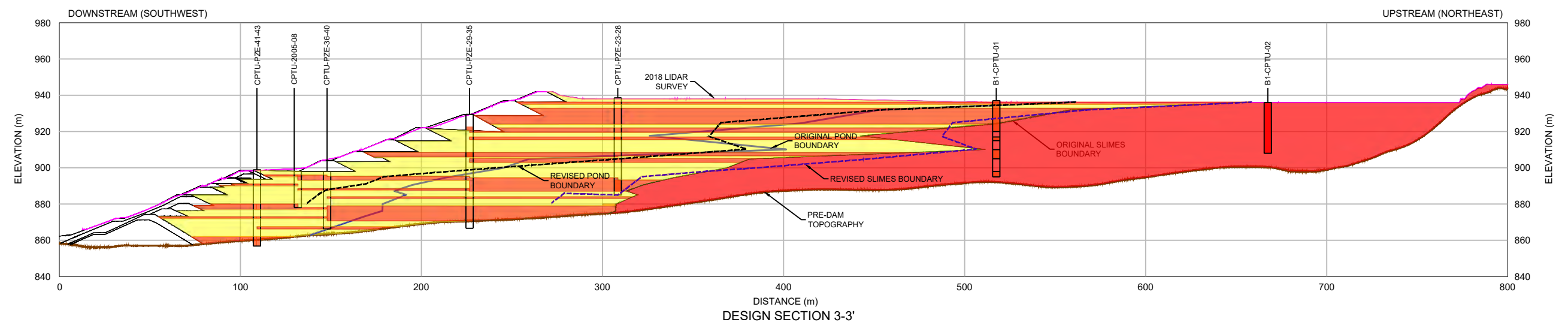
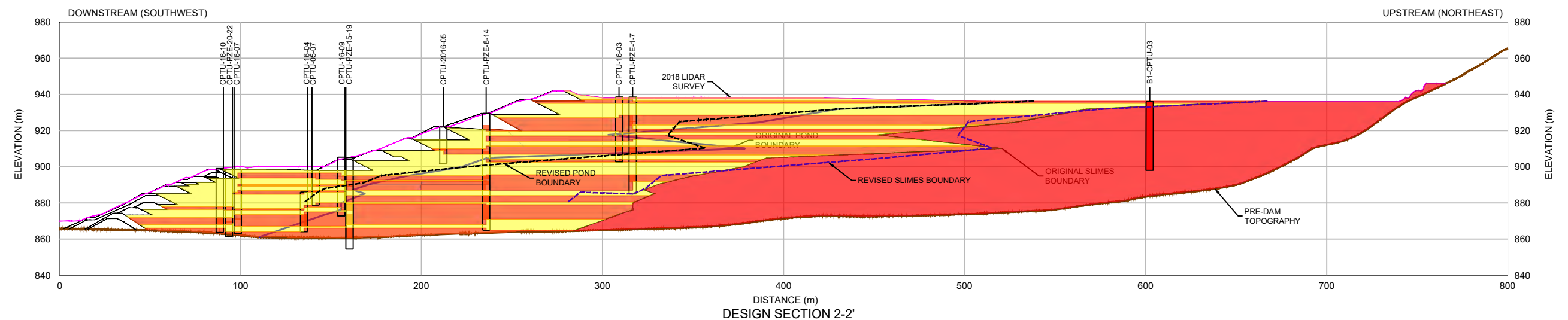
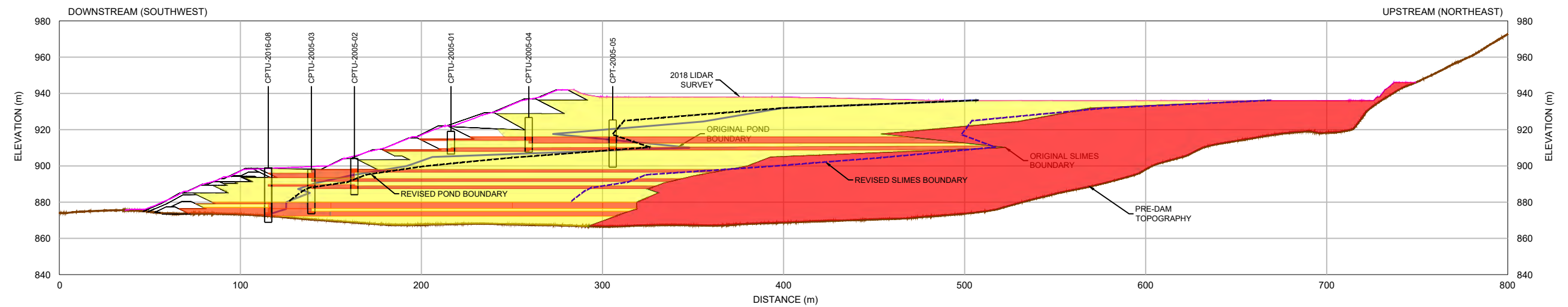
#### POND & SLIMES BOUNDARY PROFILES SECTIONS 1-1', 2-2' & 3-3'

SCALE  
1:2,500

PROJECT No.  
A03355A02

FIG. No.  
FIGURE 2





1:2,500 0 25 50 m BASED ON A 11"X 17" DRAWING SIZE

#### NOTES:

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.

#### LEGEND:

- |                          |                         |
|--------------------------|-------------------------|
| PRE-DAM TOPOGRAPHY       | REVISED POND BOUNDARY   |
| 2018 LIDAR SURVEY        | REVISED SLIMES BOUNDARY |
| CONTAINMENT BERM         | FINE TAILINGS           |
| ORIGINAL POND BOUNDARY   | COARSE TAILINGS         |
| ORIGINAL SLIMES BOUNDARY | SLIMES                  |

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT  
TITLE

2D TAILINGS DELINEATIONS MODELS  
SECTIONS 1-1', 2-2' & 3-3'

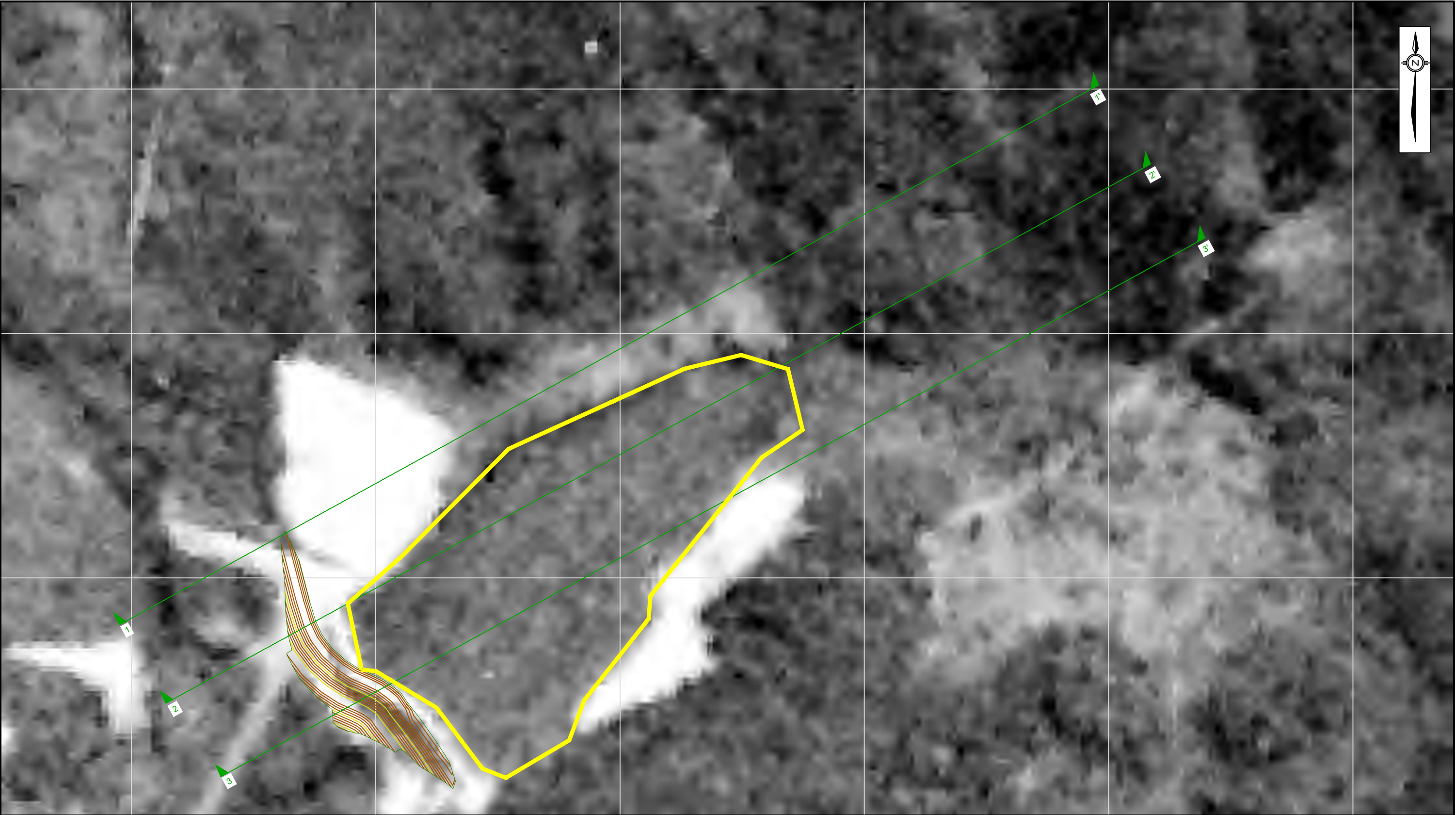
SCALE  
1:2,500

PROJECT No.  
A03355A02

FIG. No.  
FIGURE 3

## **Anexo I**



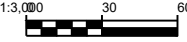


**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
2. ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
3. ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
4. DUE TO IMAGE QUALITY LOCATION OF POND COULD NOT BE ESTABLISHED.
5. SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

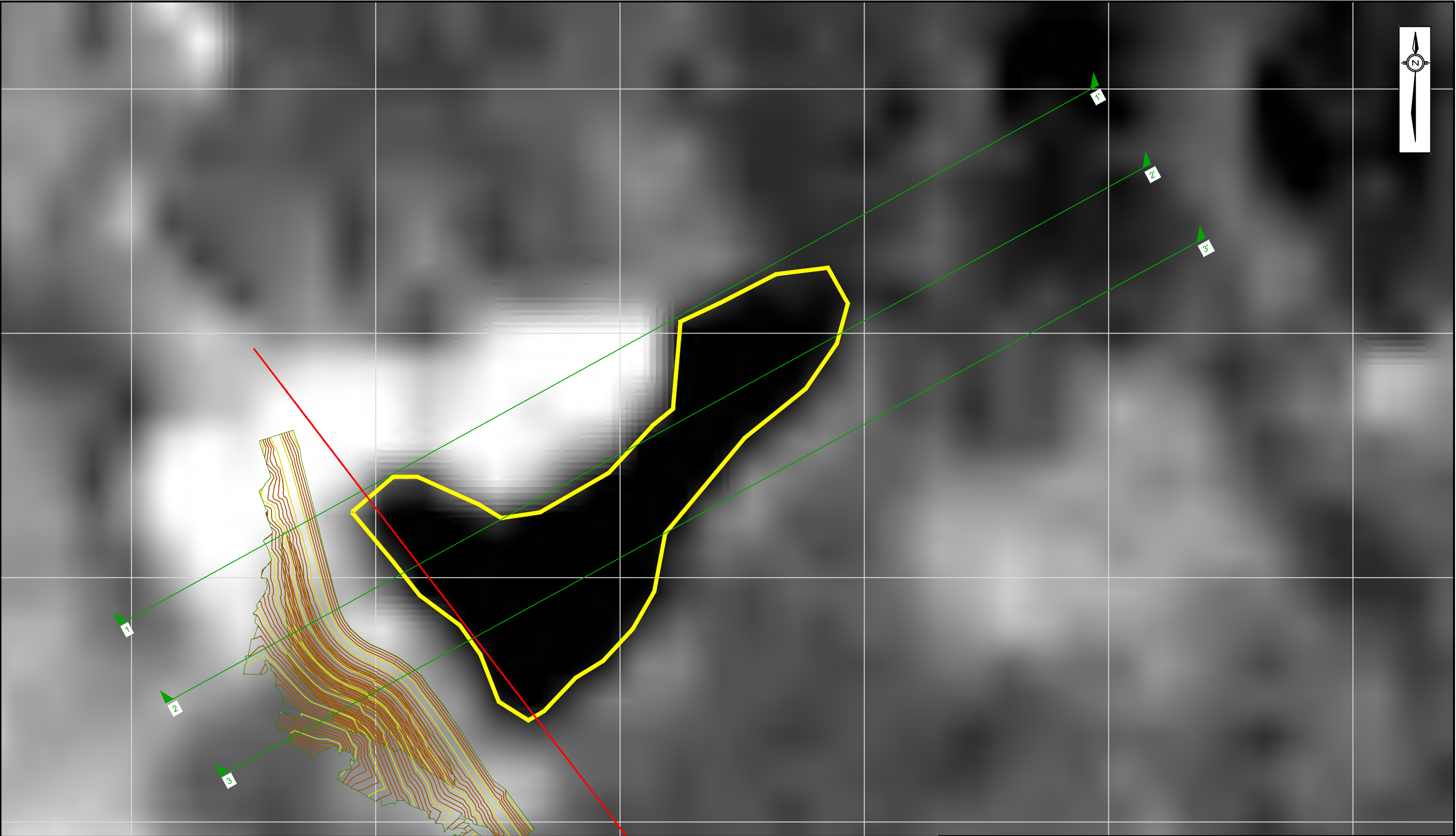
**LEGEND:**

- |                       |                   |
|-----------------------|-------------------|
| DESIGN SECTIONS       | 1 m CONTOURS      |
| POND OUTLINE          | 5 m CONTOURS      |
| MODELED POND BOUNDARY | DAM RAISE OUTLINE |



BASED ON A 11"X 17"  
DRAWING SIZE

|                  |                                                                                                                          |                        |
|------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------|
| CLIENT           | PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF<br>THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                        |
|                  | TITLE<br>SATELLITE IMAGES<br>1977 (S)<br>RAISE #1<br>DAM CREST EL. 874 m                                                 |                        |
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02                                                                                                 | FIG. No.<br>FIGURE I-1 |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESMENT.

**LEGEND:**

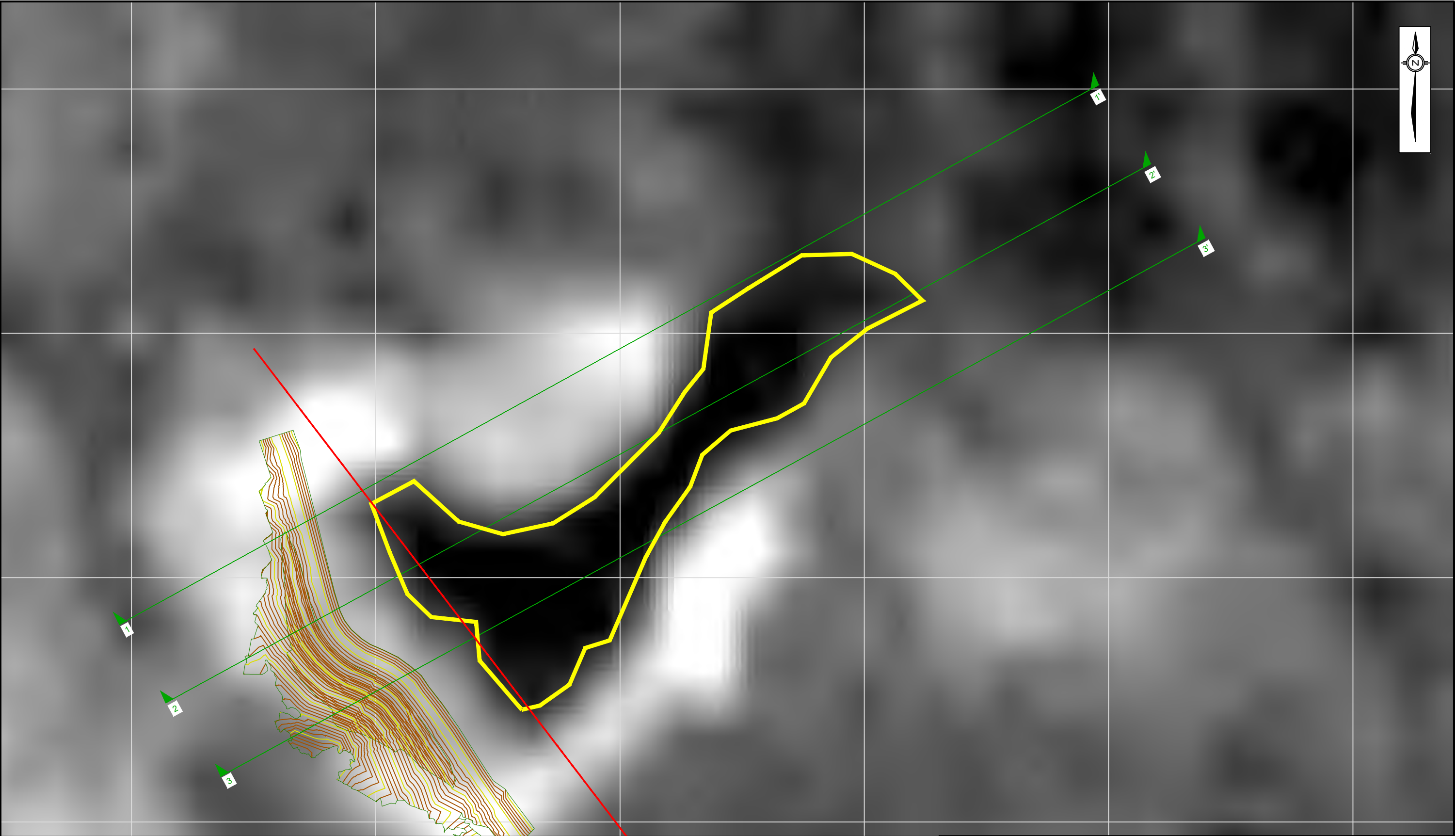
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                  |                          |                                                                                                                       |  |
|------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------|--|
| CLIENT           |                          | PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |  |
|                  |                          | TITLE<br><b>SATELLITE IMAGES<br/>APRIL 19, 1984 (S)<br/>RAISE #4<br/>DAM CREST EL. 884 m</b>                          |  |
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-2                                                                                                |  |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

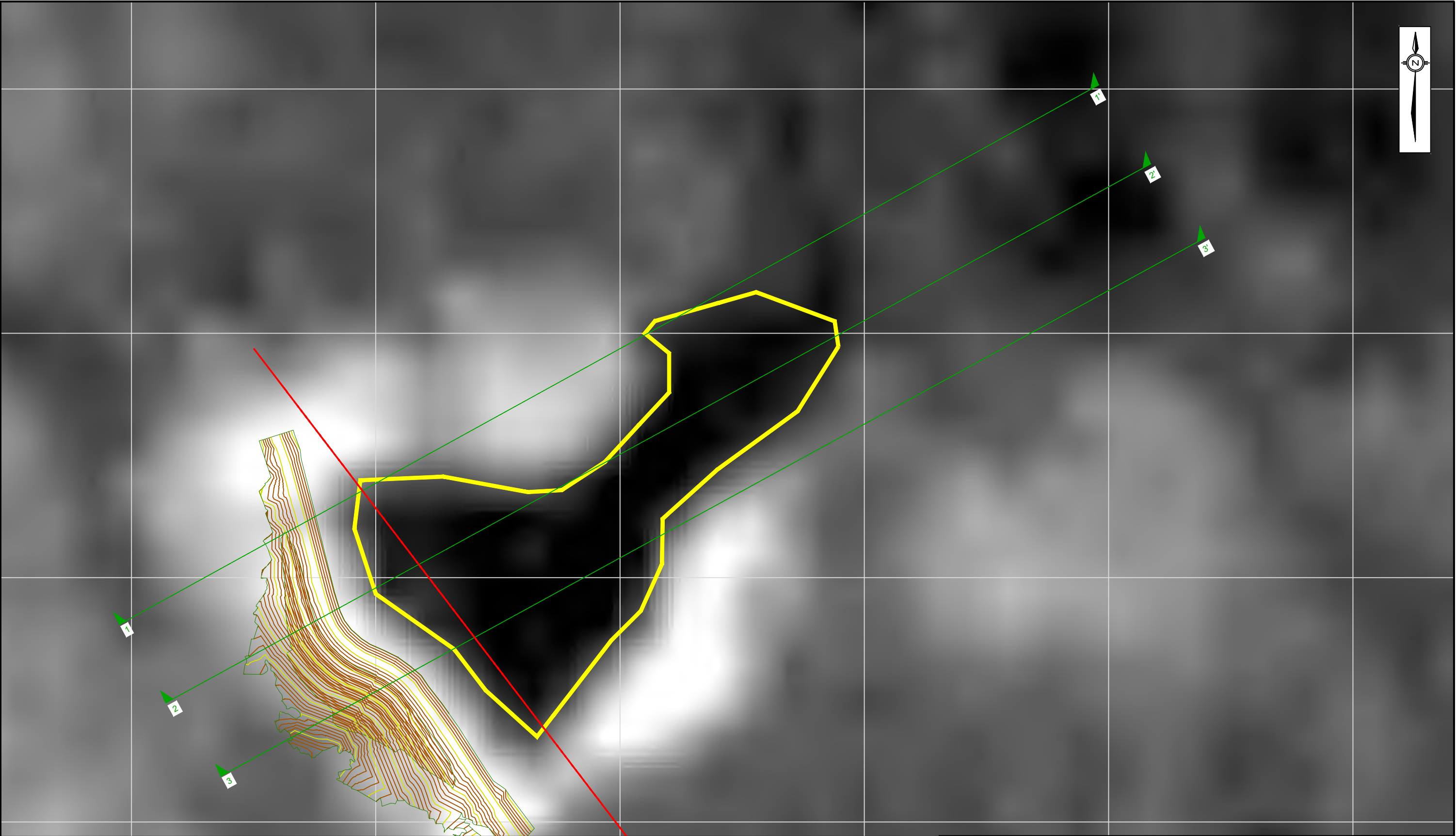
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JUNE 6, 1984 (S)<br>RAISE #4<br>DAM CREST EL. 884 m                                    |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-3                                                                                                 |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

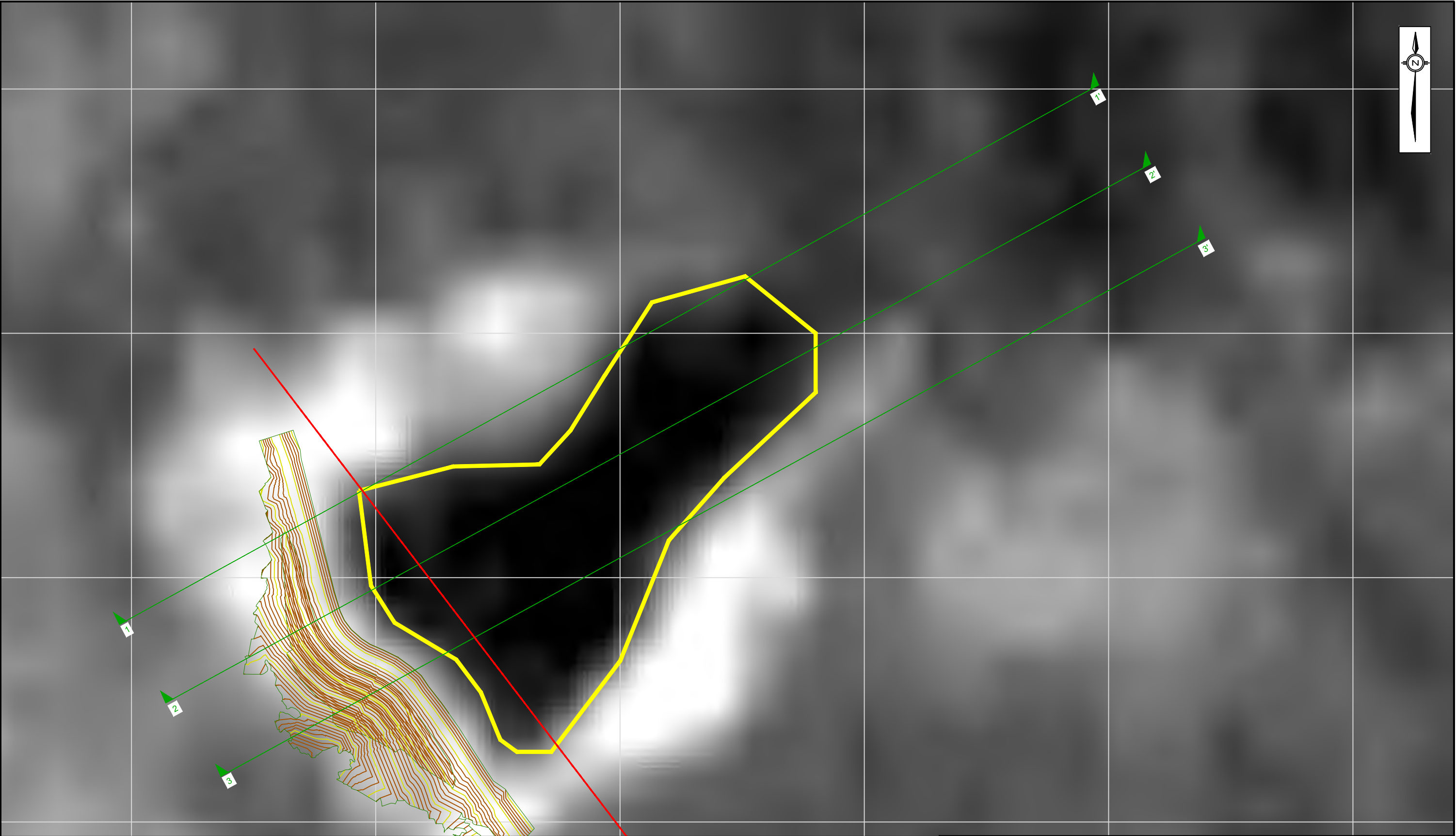
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 0 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JULY 8, 1984 (S)<br>RAISE #4<br>DAM CREST EL. 884 m                                    |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-4                                                                                                 |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

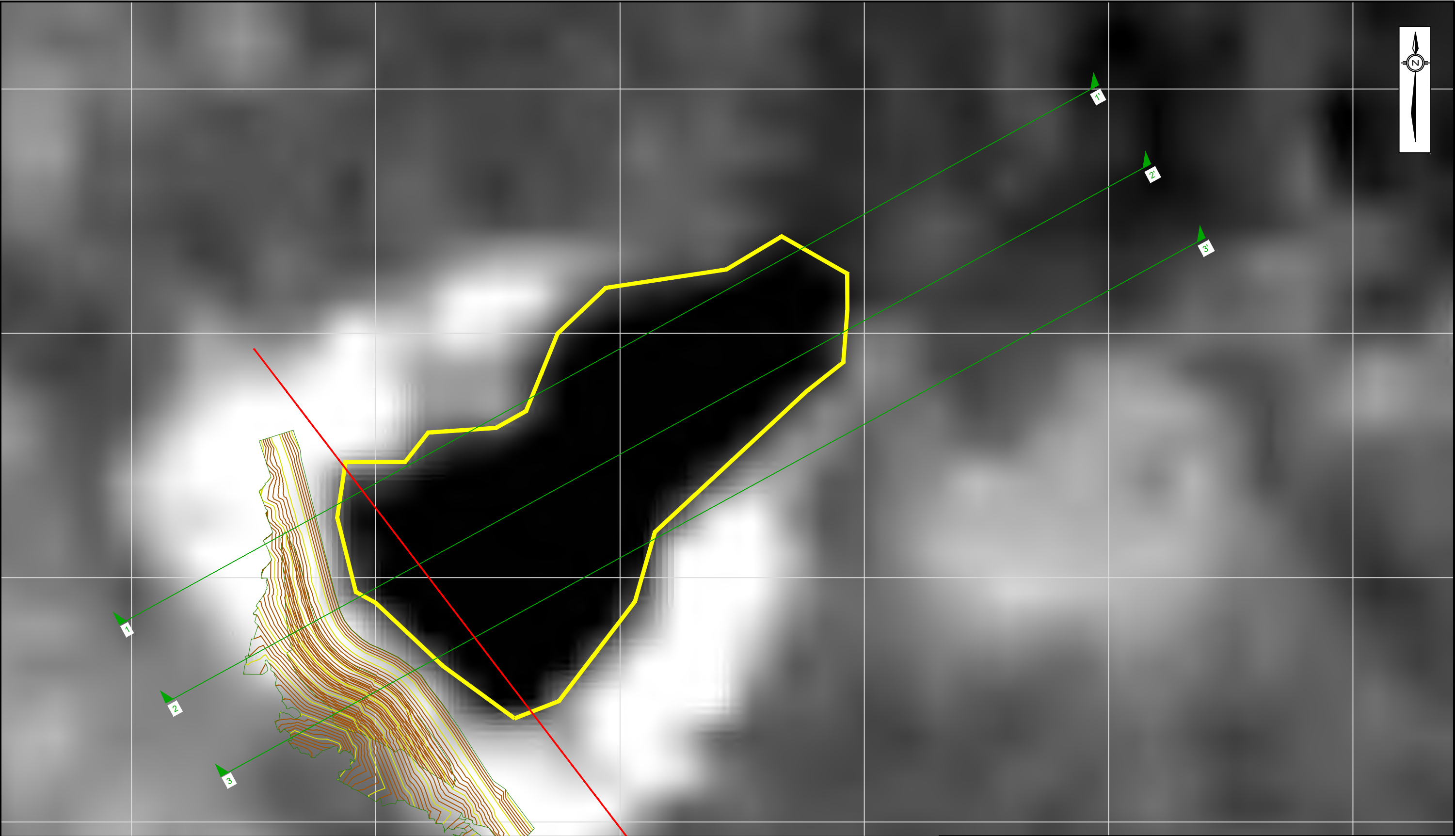
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JULY 24, 1984 (S)<br>RAISE #4<br>DAM CREST EL. 884 m                                   |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-5                                                                                                 |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

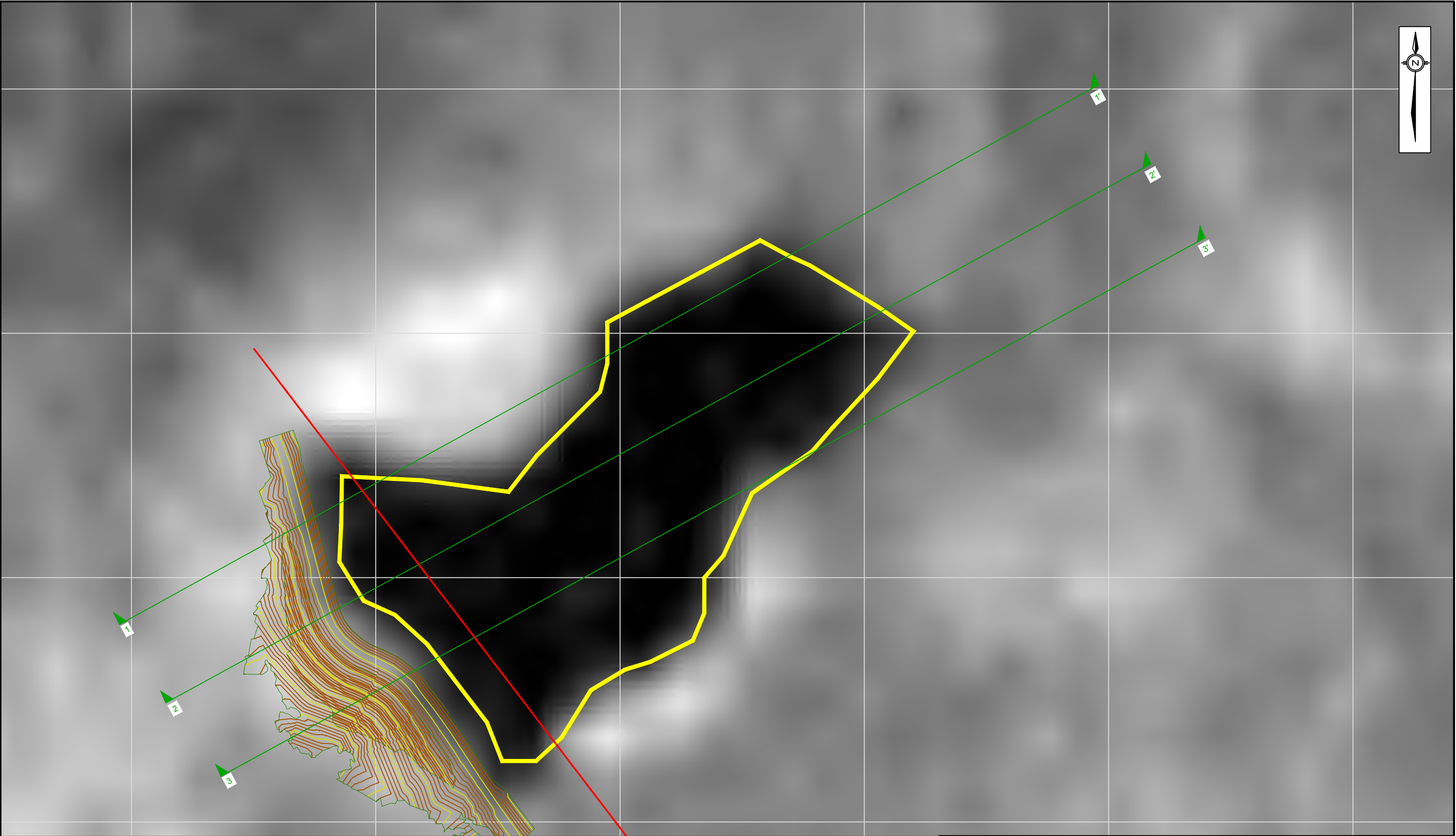
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
AUGUST 9, 1984 (S)  
RAISE #4  
DAM CREST EL. 884 m**

|                  |                          |                        |
|------------------|--------------------------|------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-6 |
|------------------|--------------------------|------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

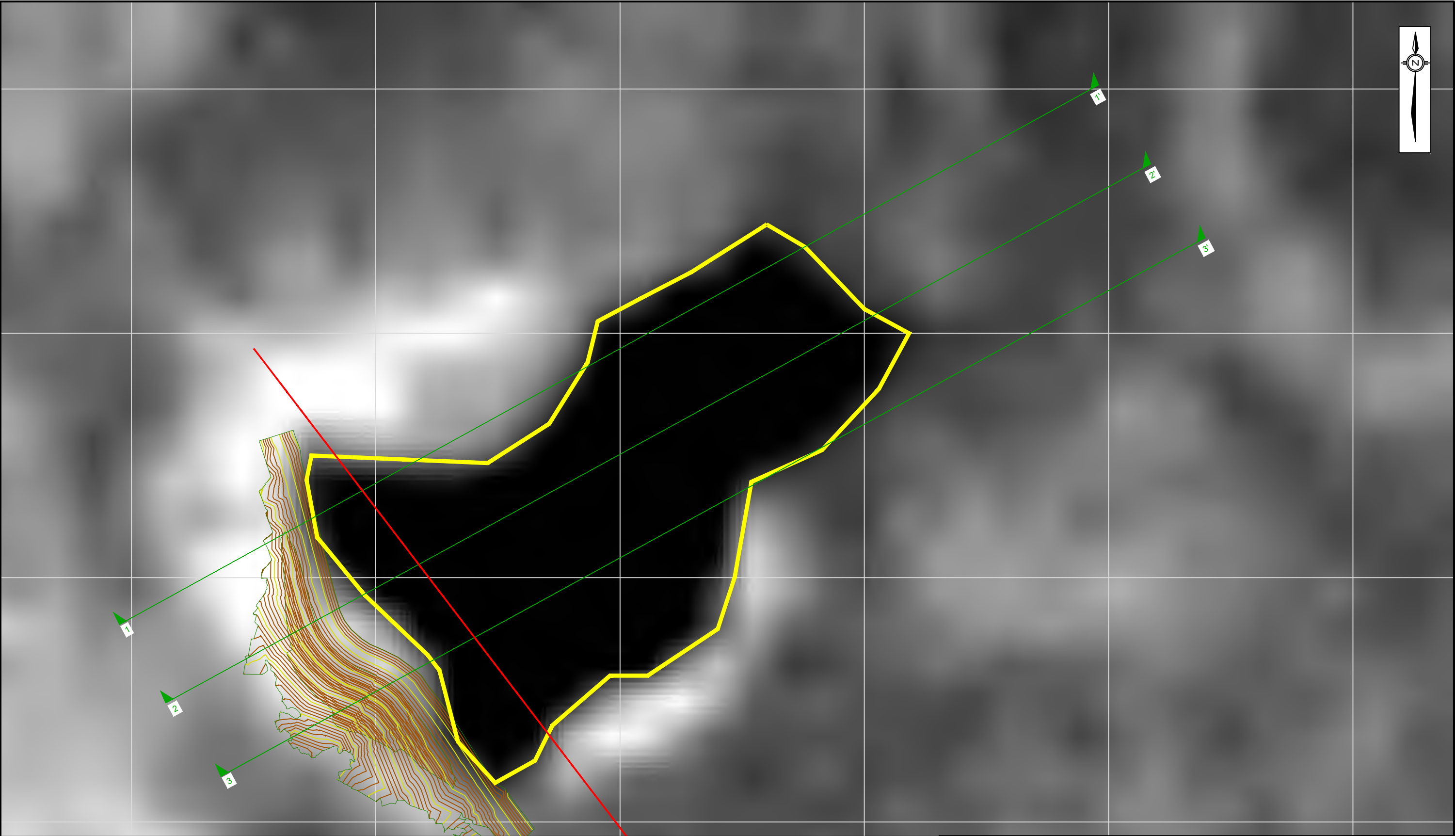
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>FEBRUARY 1, 1985 (S)<br>RAISE #4<br>DAM CREST EL. 884 m                                |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-7                                                                                                 |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

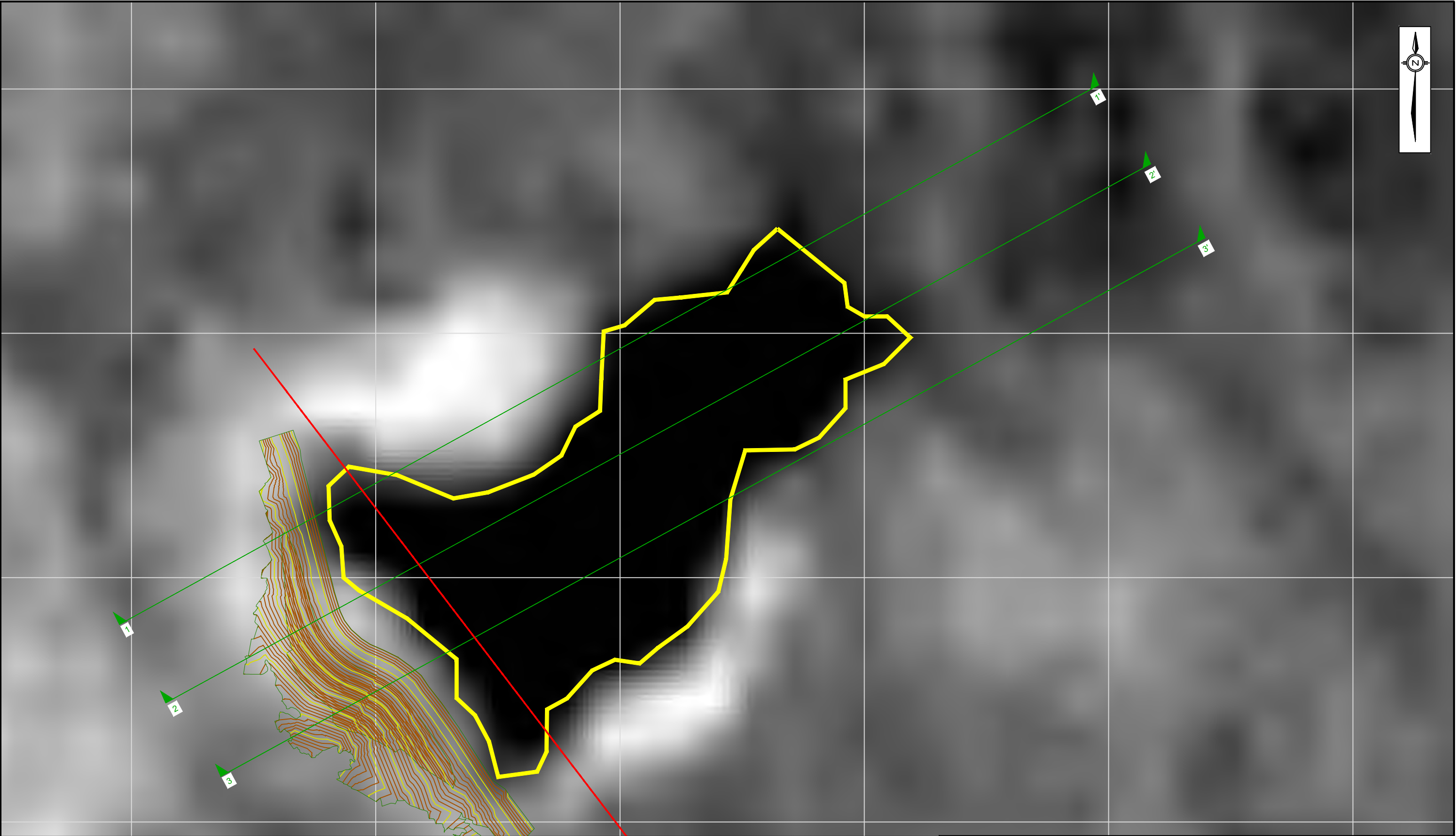
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>FEBRUARY 17, 1985 (S)<br>RAISE #4<br>DAM CREST EL. 884 m                               |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-8                                                                                     |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

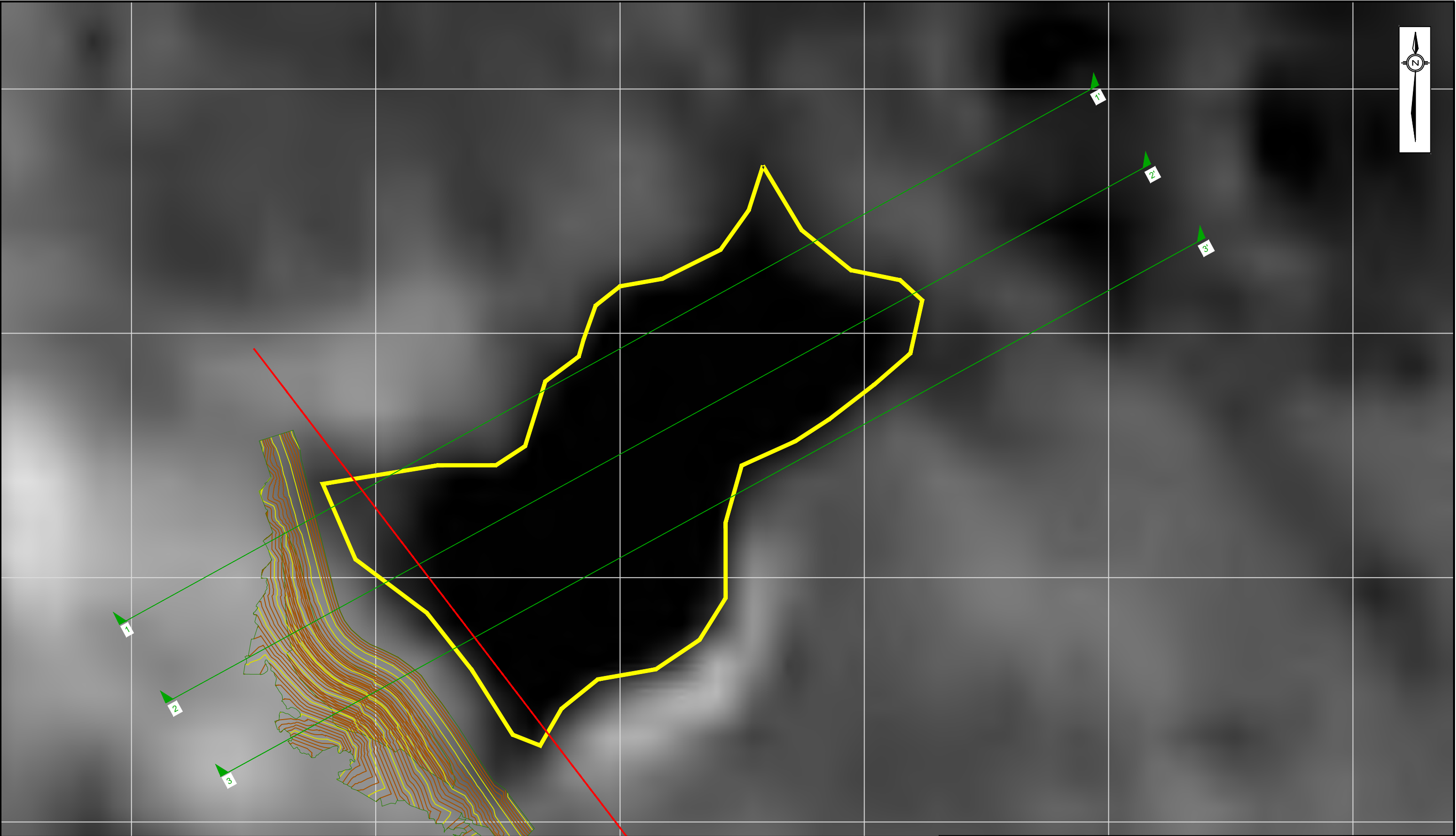
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                  |                          |                                                                                                                       |  |
|------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------|--|
| CLIENT           |                          | PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |  |
|                  |                          | TITLE<br><b>SATELLITE IMAGES<br/>APRIL 22, 1985 (S)<br/>RAISE #4<br/>DAM CREST EL. 884</b>                            |  |
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-9                                                                                                |  |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

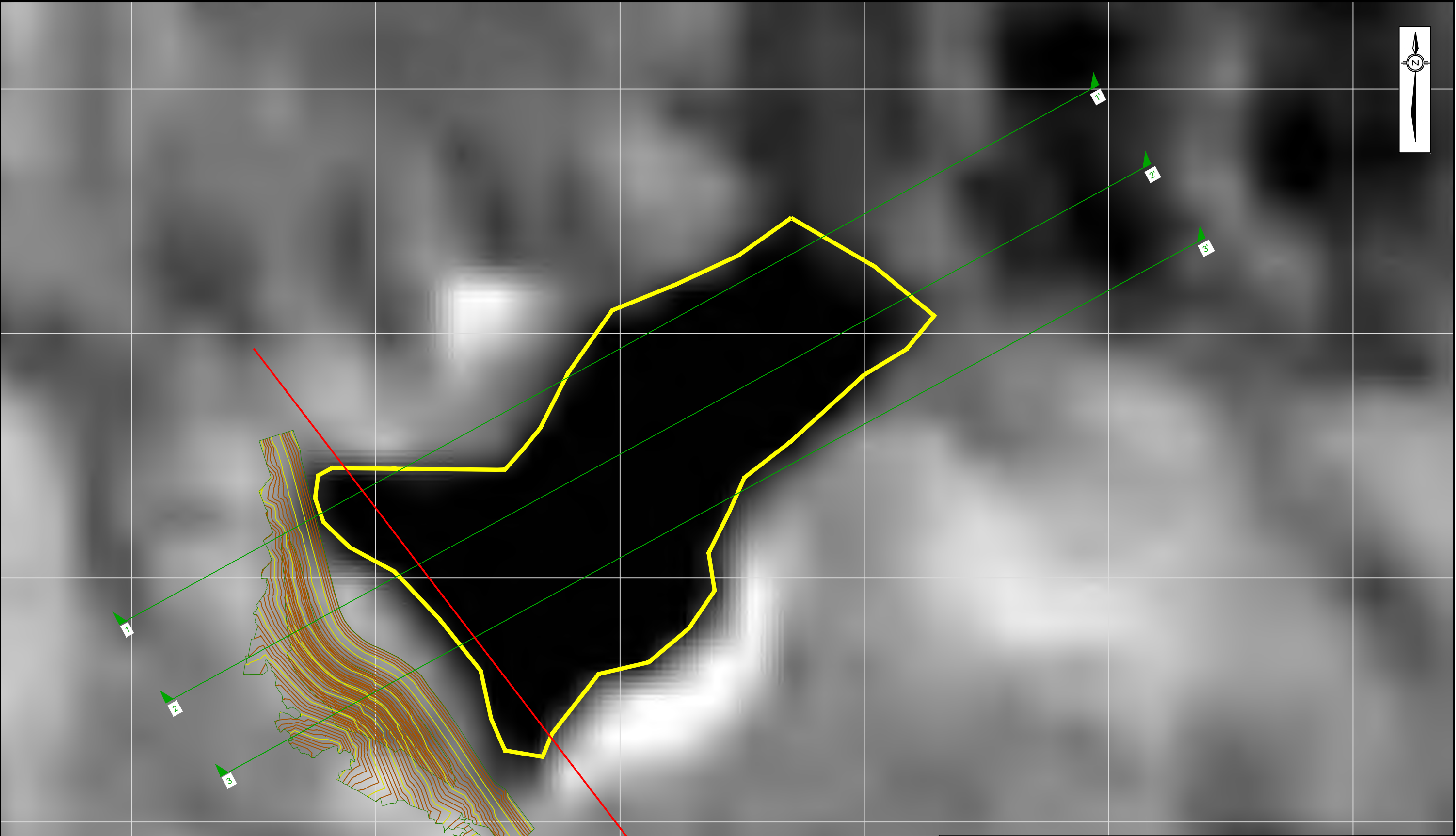
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
MAY 8, 1985 (S)  
RAISE #4  
DAM CREST EL. 884 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-10 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

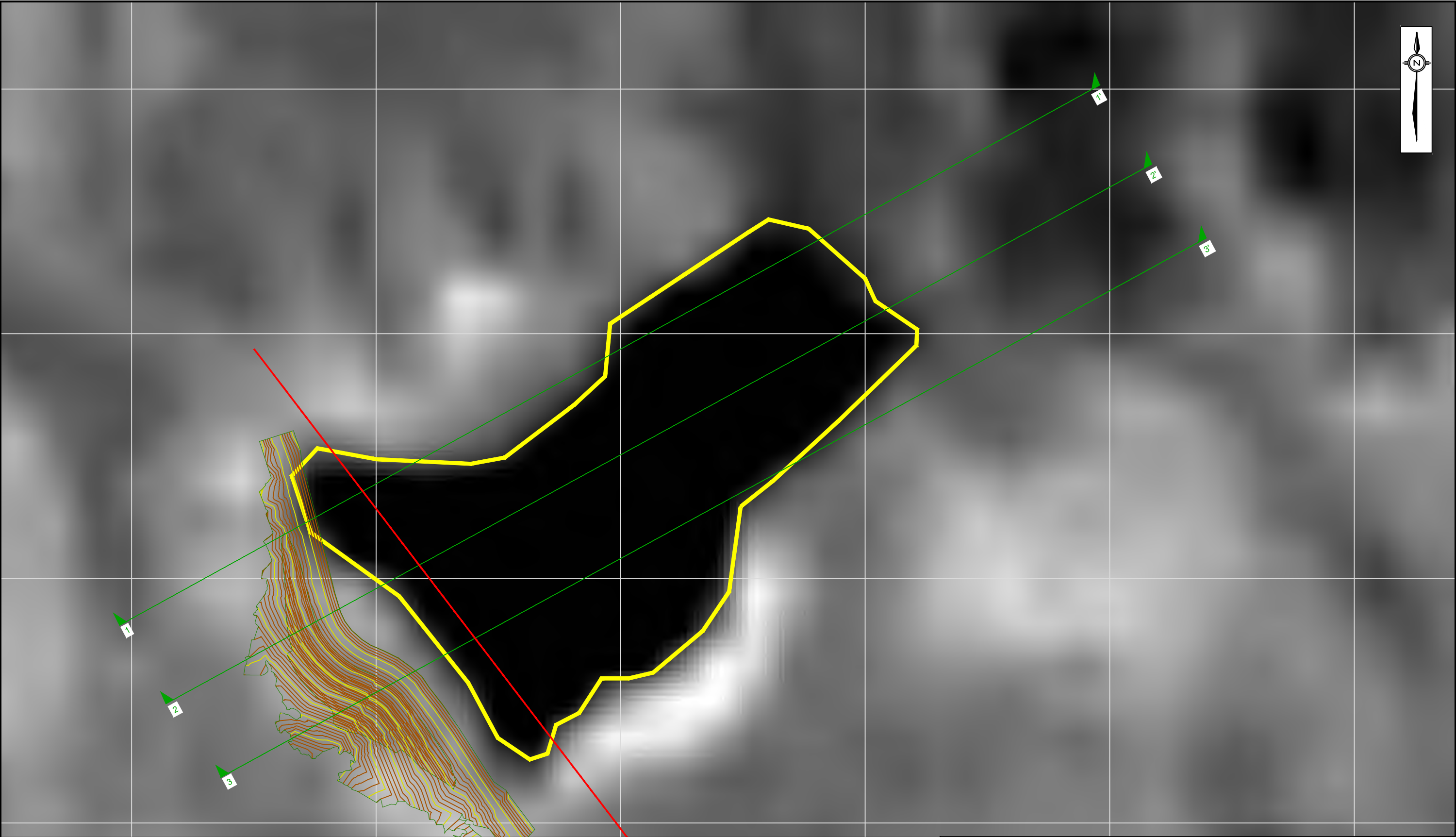
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JUNE 25, 1985 (S)<br>RAISE #4<br>DAM CREST EL. 884 m                                   |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-11                                                                                                |             |





**NOTES:**

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- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

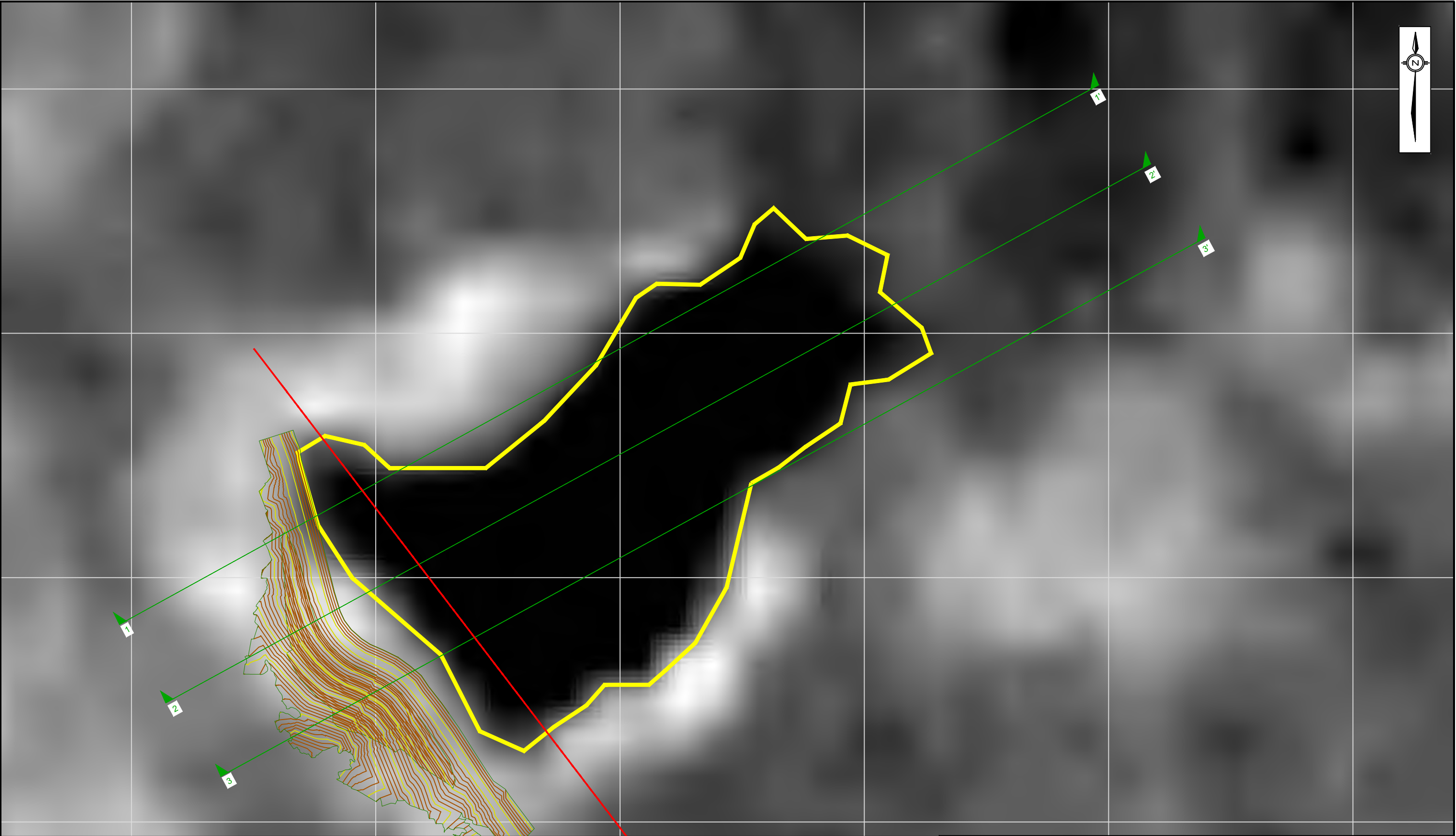
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>AUGUST 12, 1985 (S)<br>RAISE #4<br>DAM CREST EL. 884 m                                 |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-12                                                                                    |                          |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 4) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

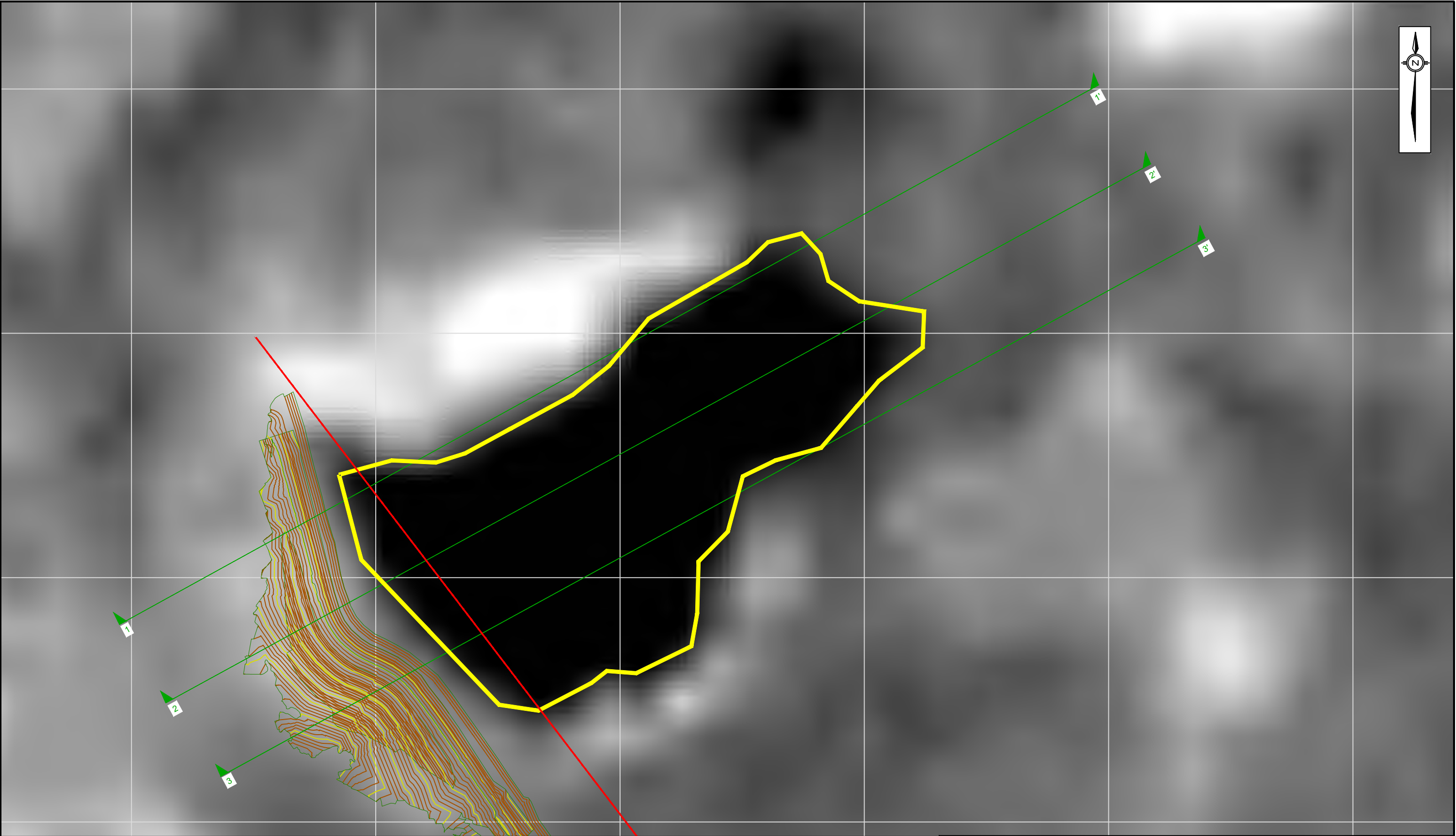
PROJECT

REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
AUGUST 28, 1985 (S)  
RAISE #4  
DAM CREST EL. 884 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-13 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT

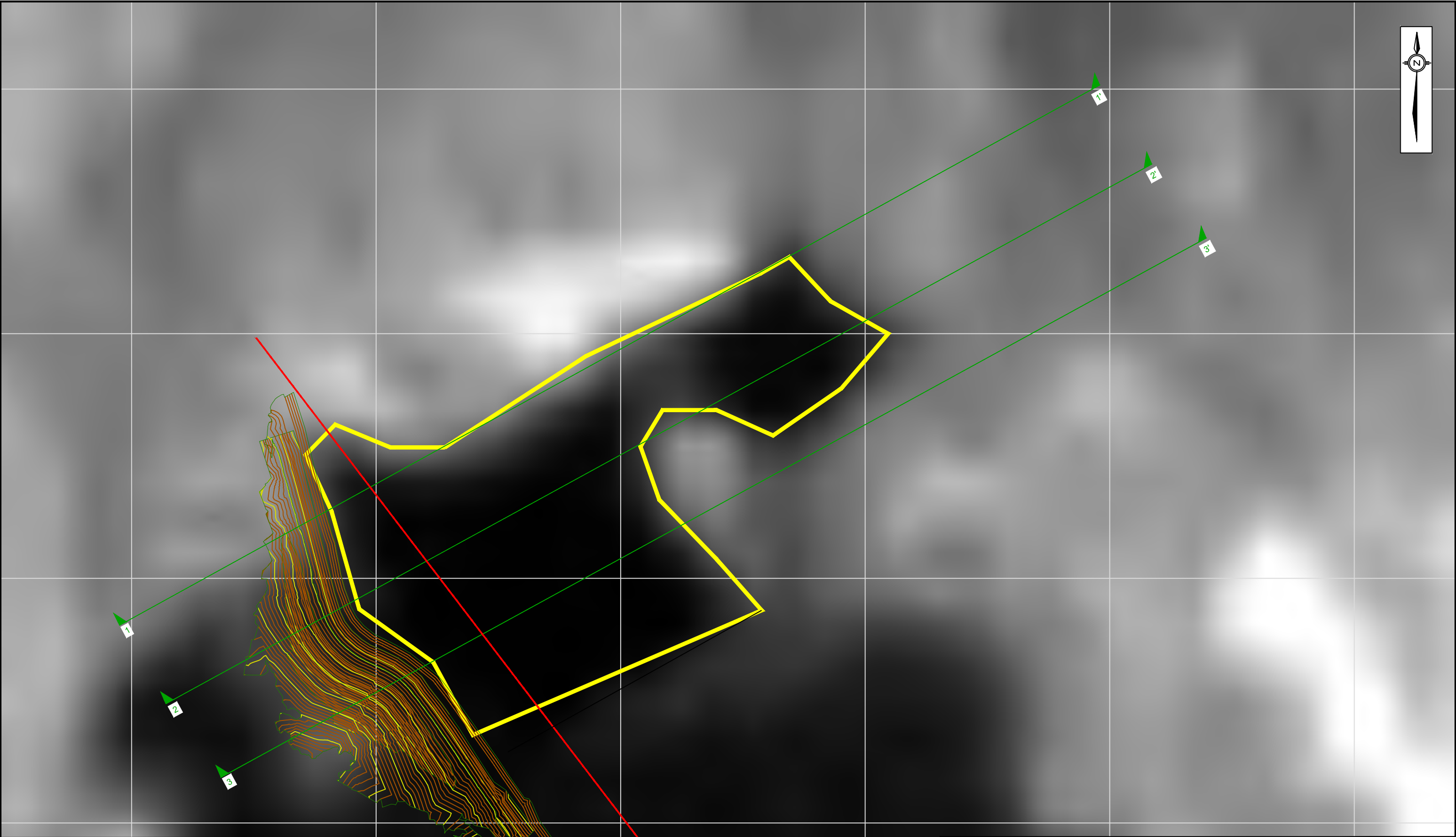
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
JANUARY 3, 1986 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-14 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

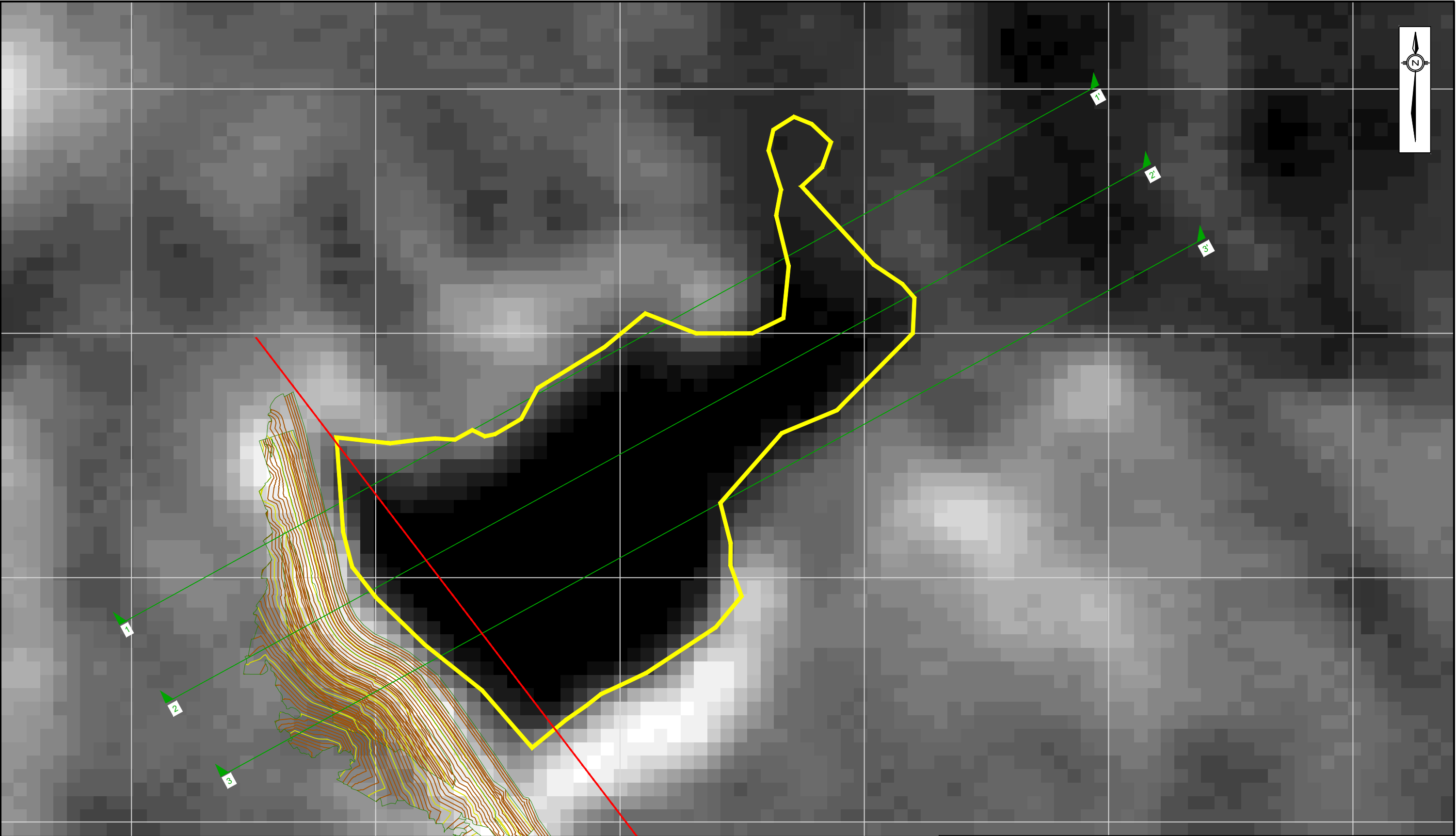
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
FEBRUARY 20, 1986 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-15 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

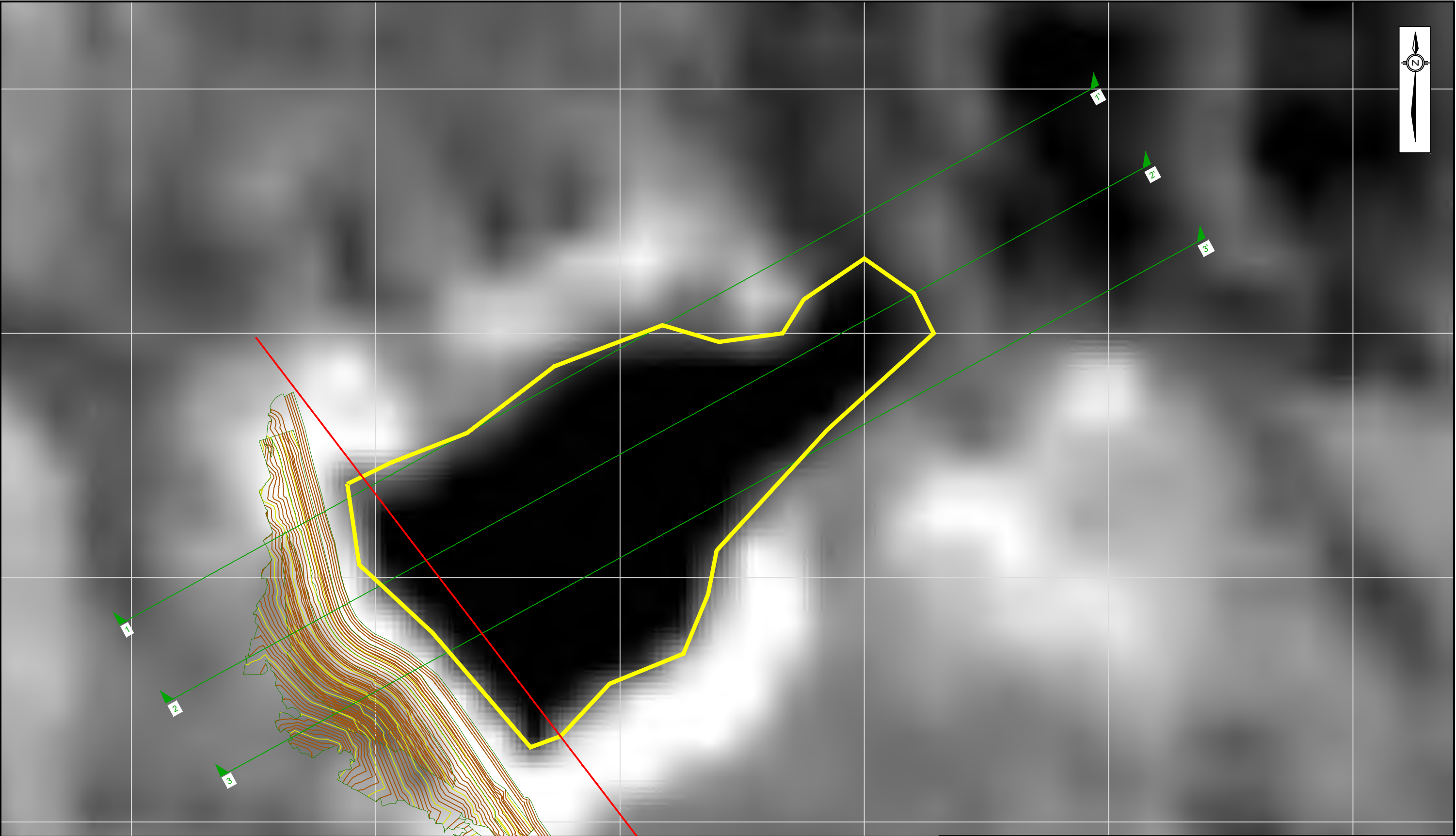
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
MAY 27, 1986 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-16 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

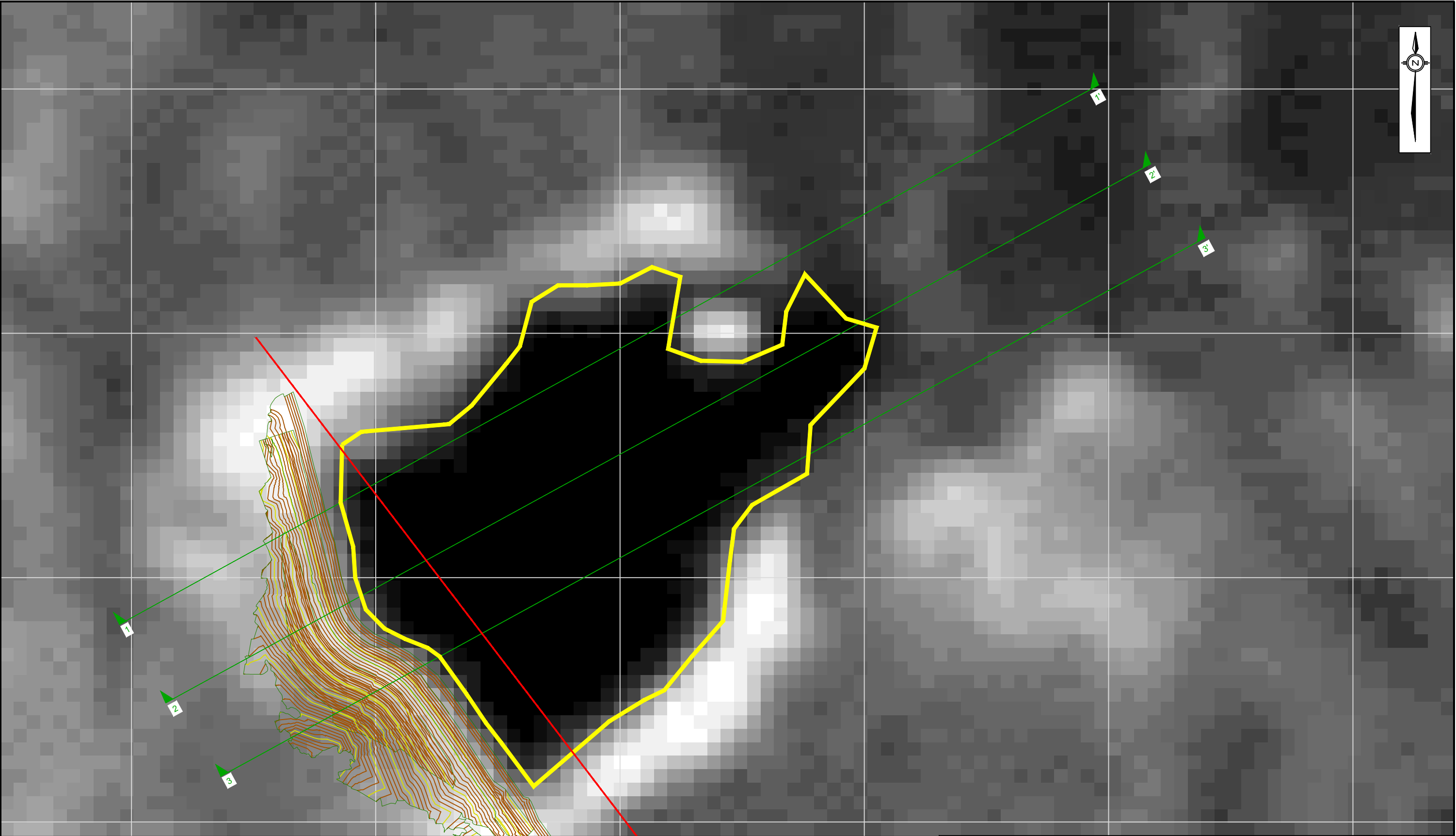
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |             |
|---------|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT  | PROJECT                                                                                                    |             |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
|         | TITLE                                                                                                      |             |
|         | SATELLITE IMAGES<br>JULY 14, 1986 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                   |             |
| SCALE   | PROJECT No.                                                                                                | FIG. No.    |
| 1:3,000 | A03355A02                                                                                                  | FIGURE I-17 |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

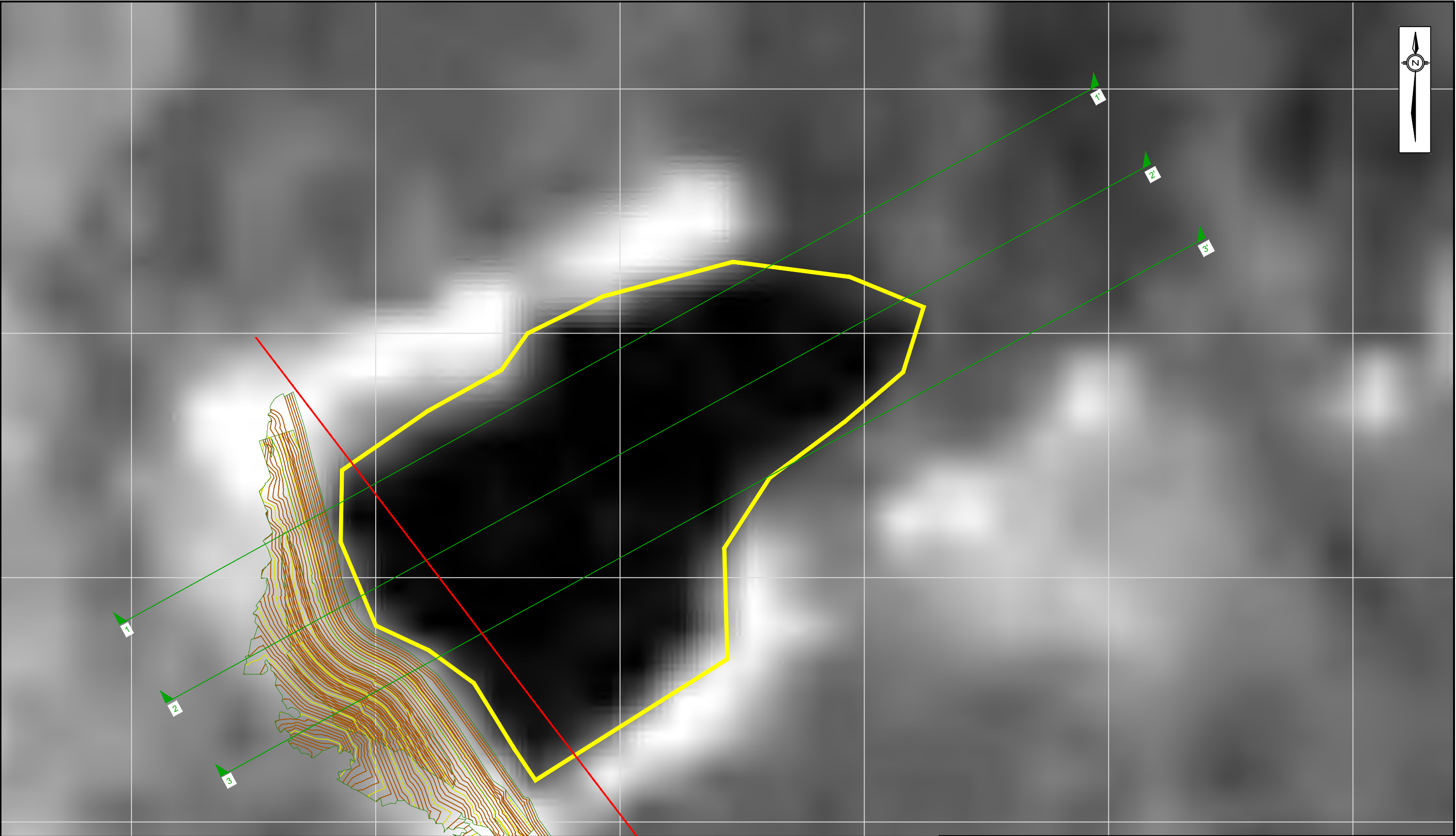
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 15, 1986 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-18                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

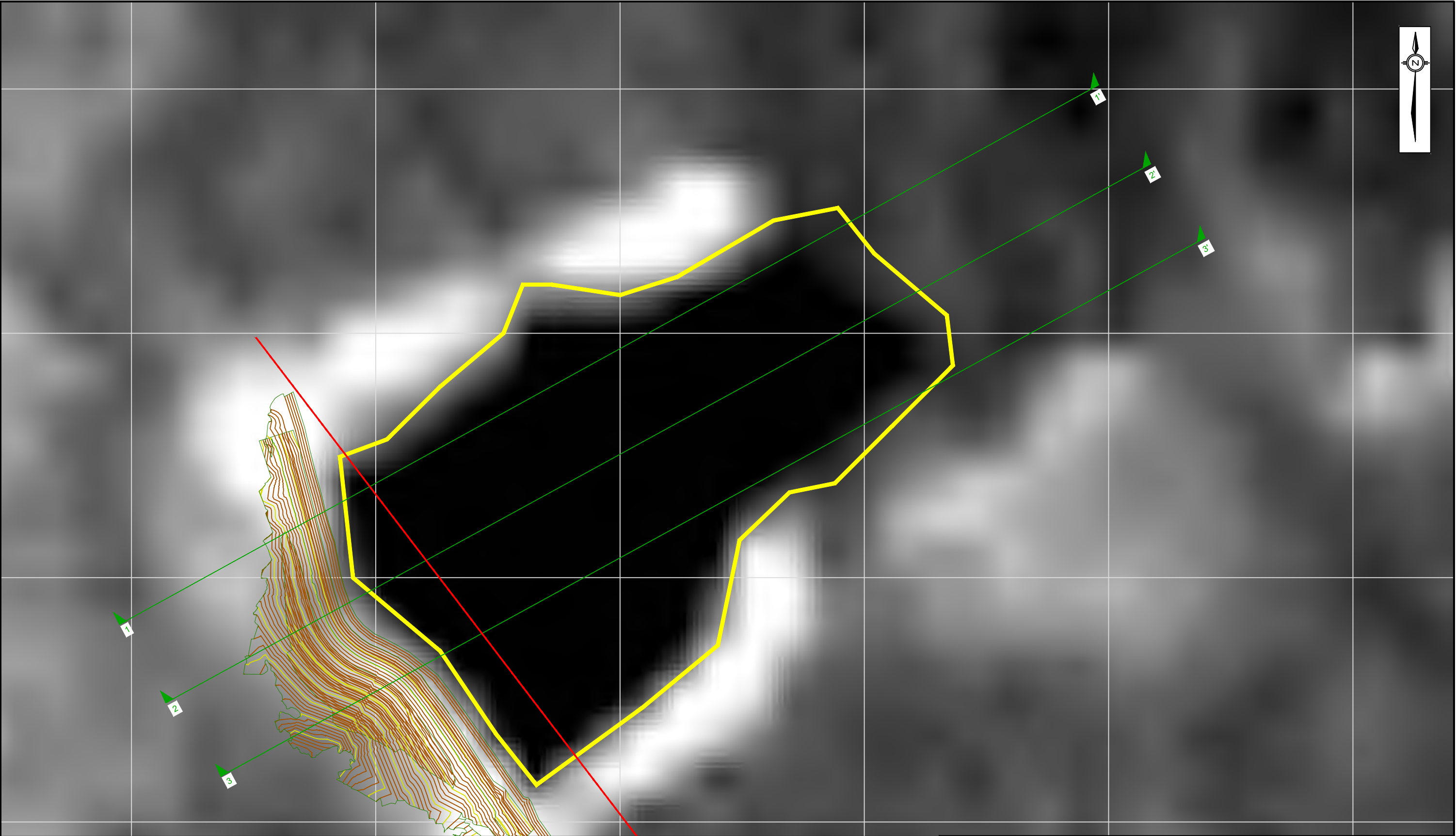
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 31, 1986 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-19                                                                                                |             |





**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
2. ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
3. ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
4. SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

- |                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |



BASED ON A 11"X 17"  
DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

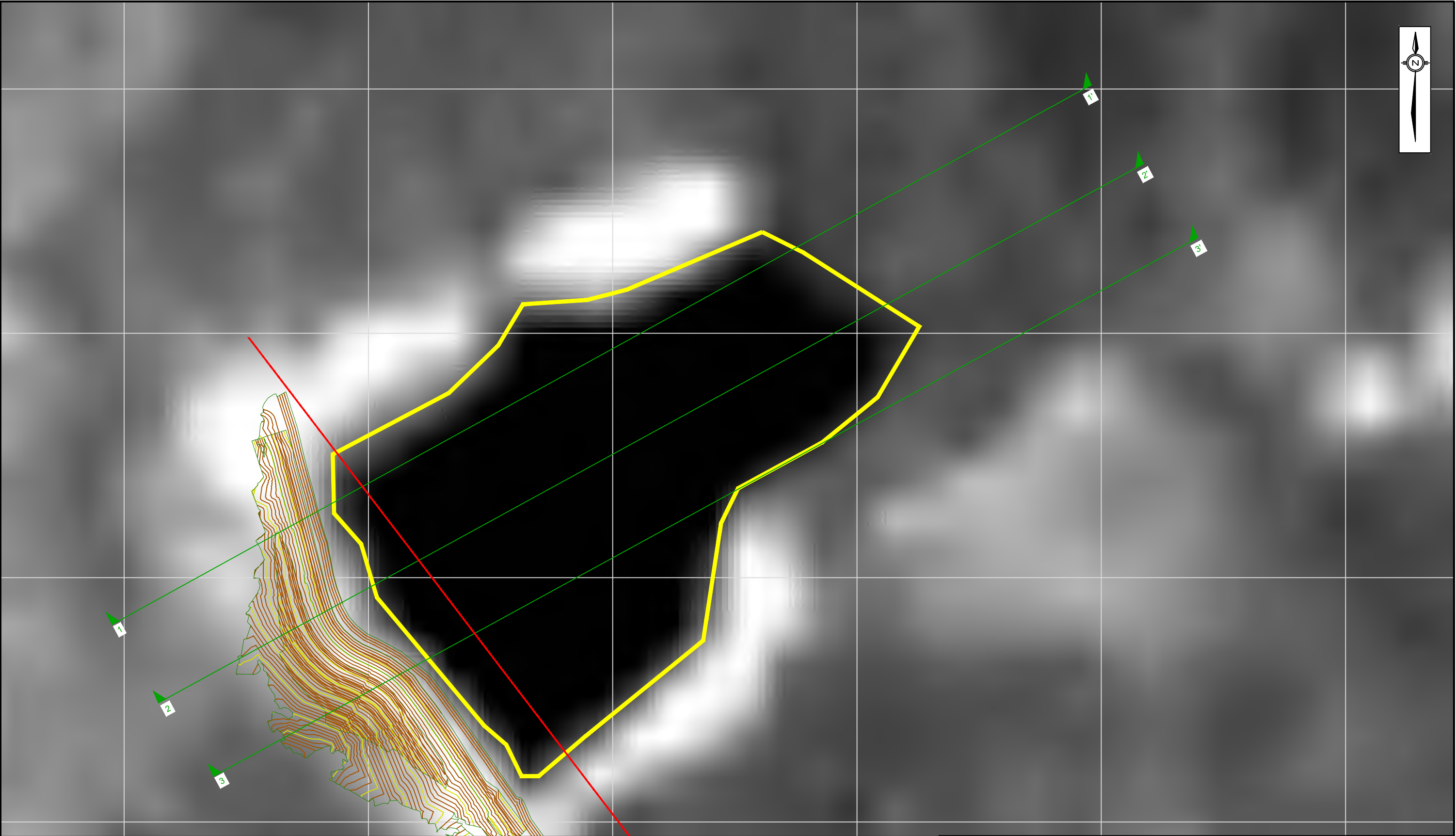
TITLE  
**SATELLITE IMAGES  
SEPTEMBER 16, 1986 (S)  
RAISE #5  
DAM CREST EL. 889 m**

SCALE  
1:3,000

PROJECT No.  
A03355A02

FIG. No.  
FIGURE I-20

ROB-1168-L



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

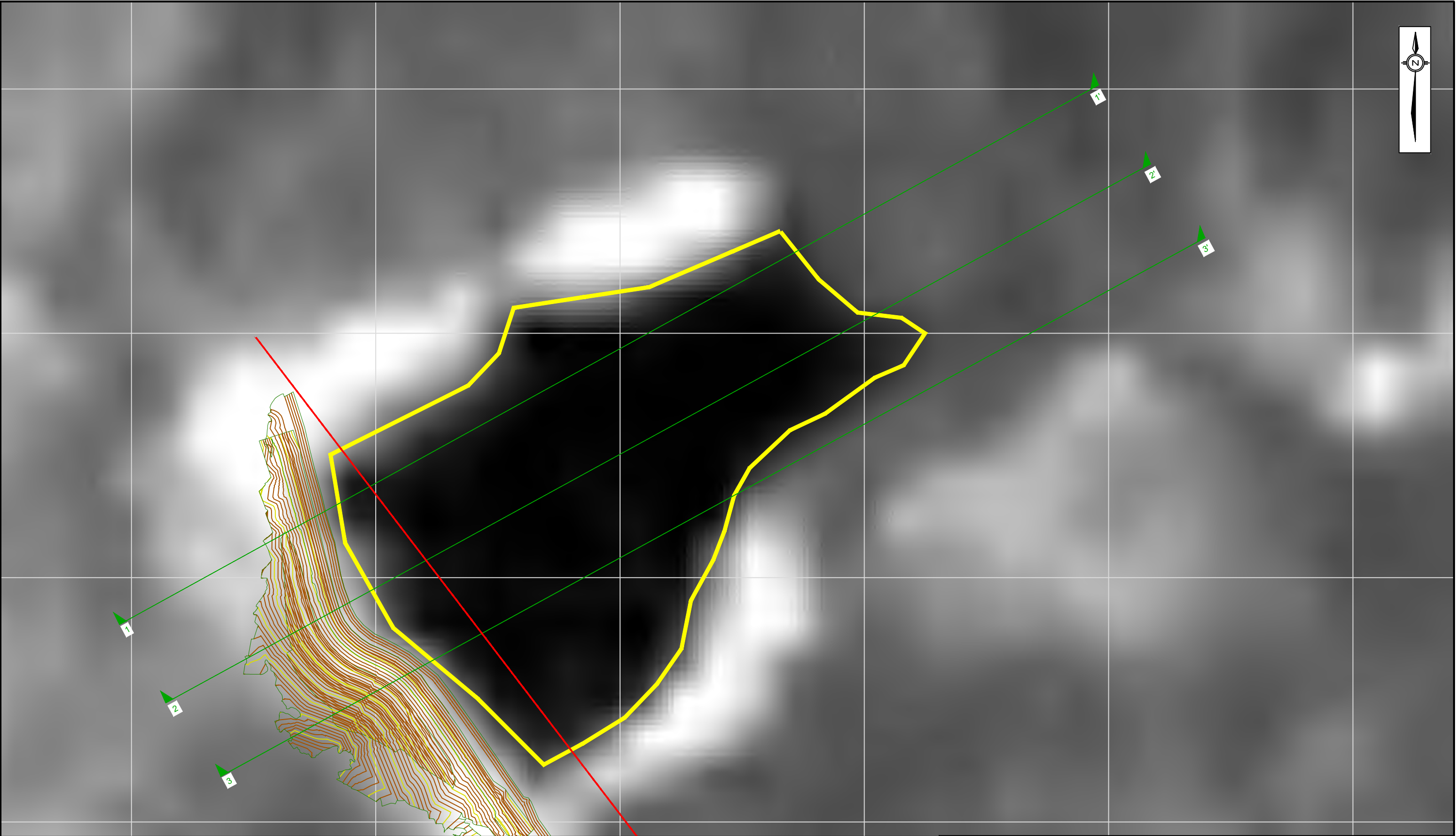
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
OCTOBER 2, 1986 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-21 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

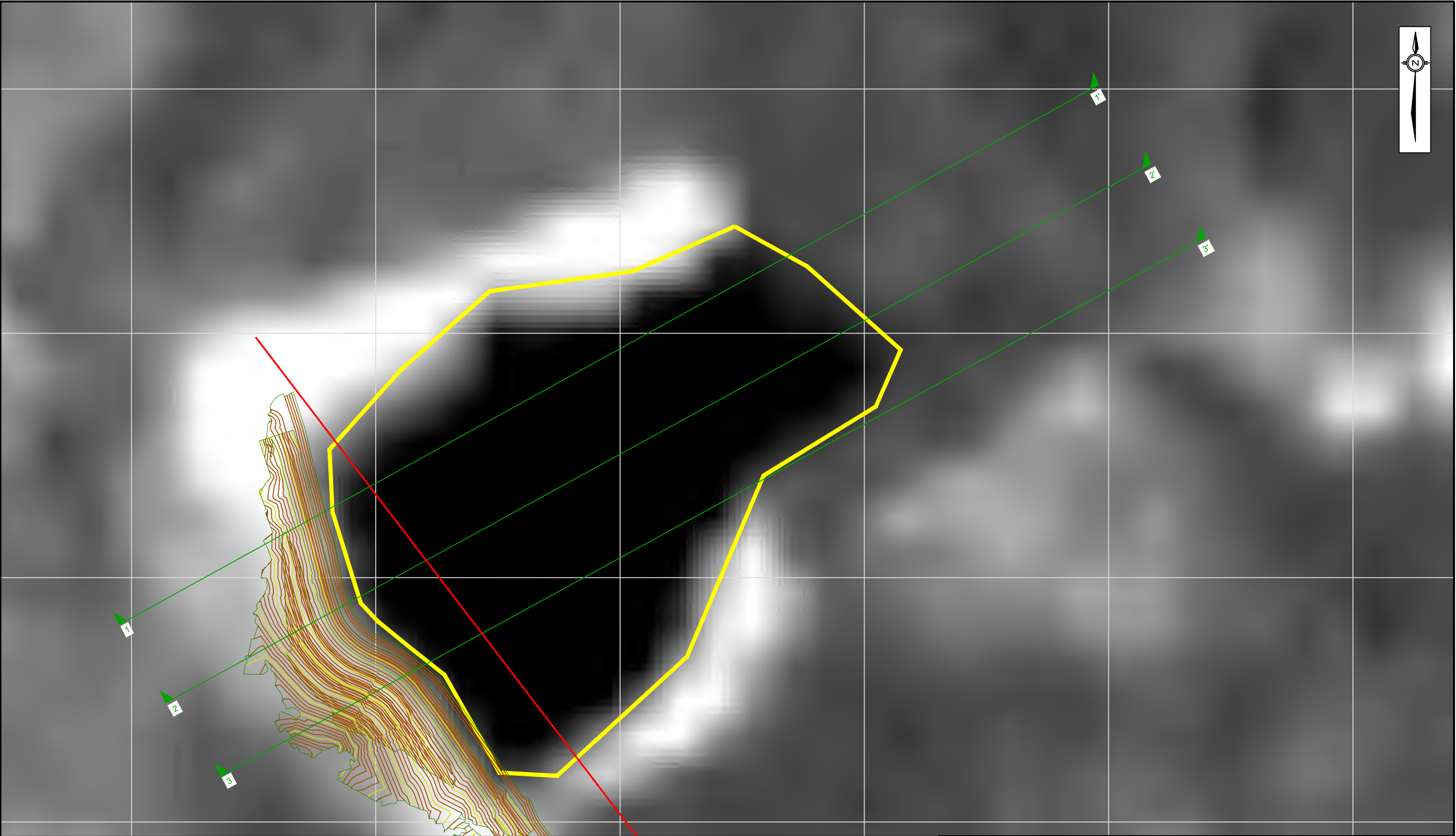
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                |                          |
|                                                                                                                       |                          |
|                                                                                                                       |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br>SATELLITE IMAGES<br>OCTOBER 18, 1986 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                  |                          |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-22                                                                                               |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

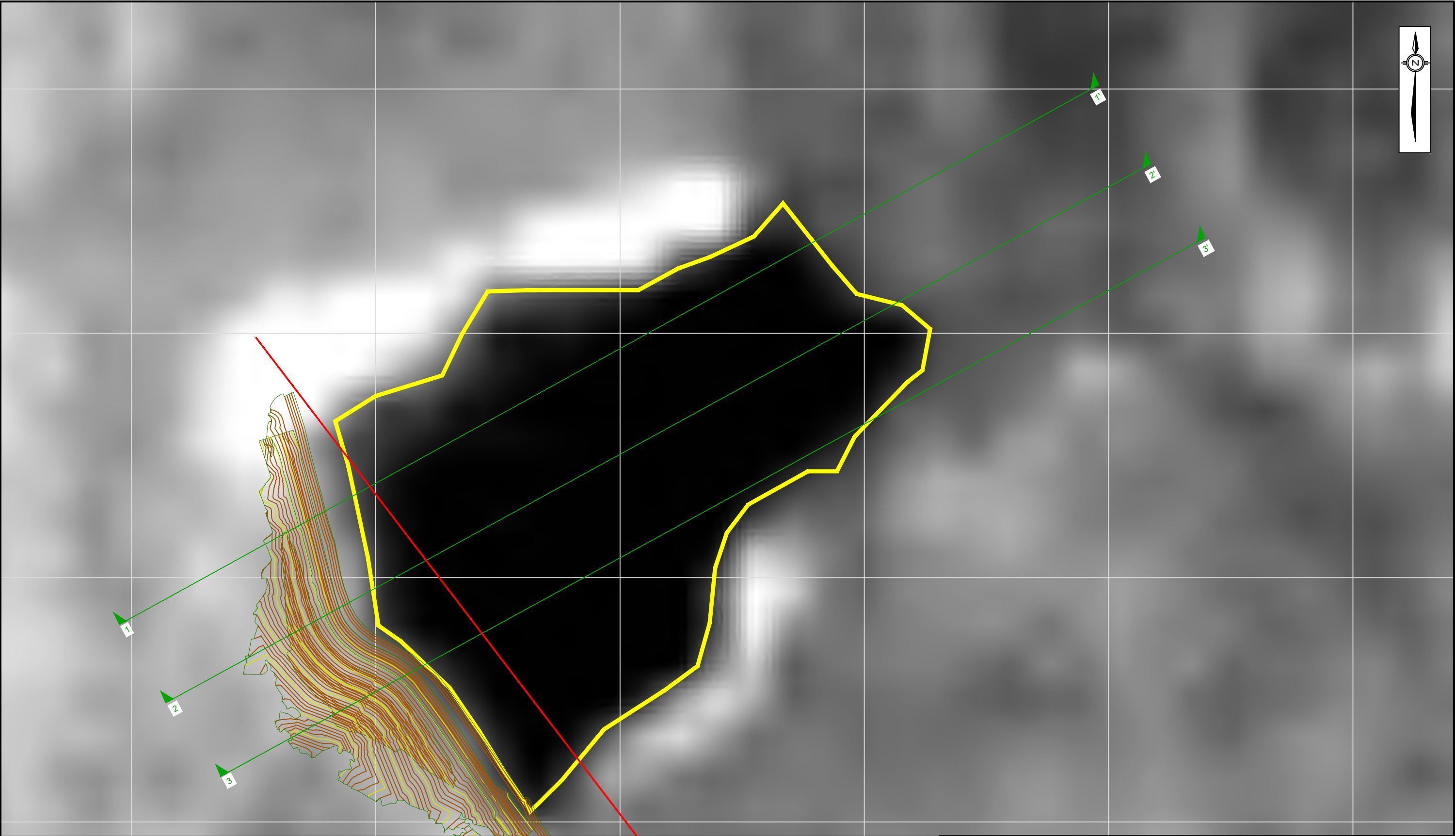
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>NOVEMBER 3, 1986 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-23                                                                                    |                          |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

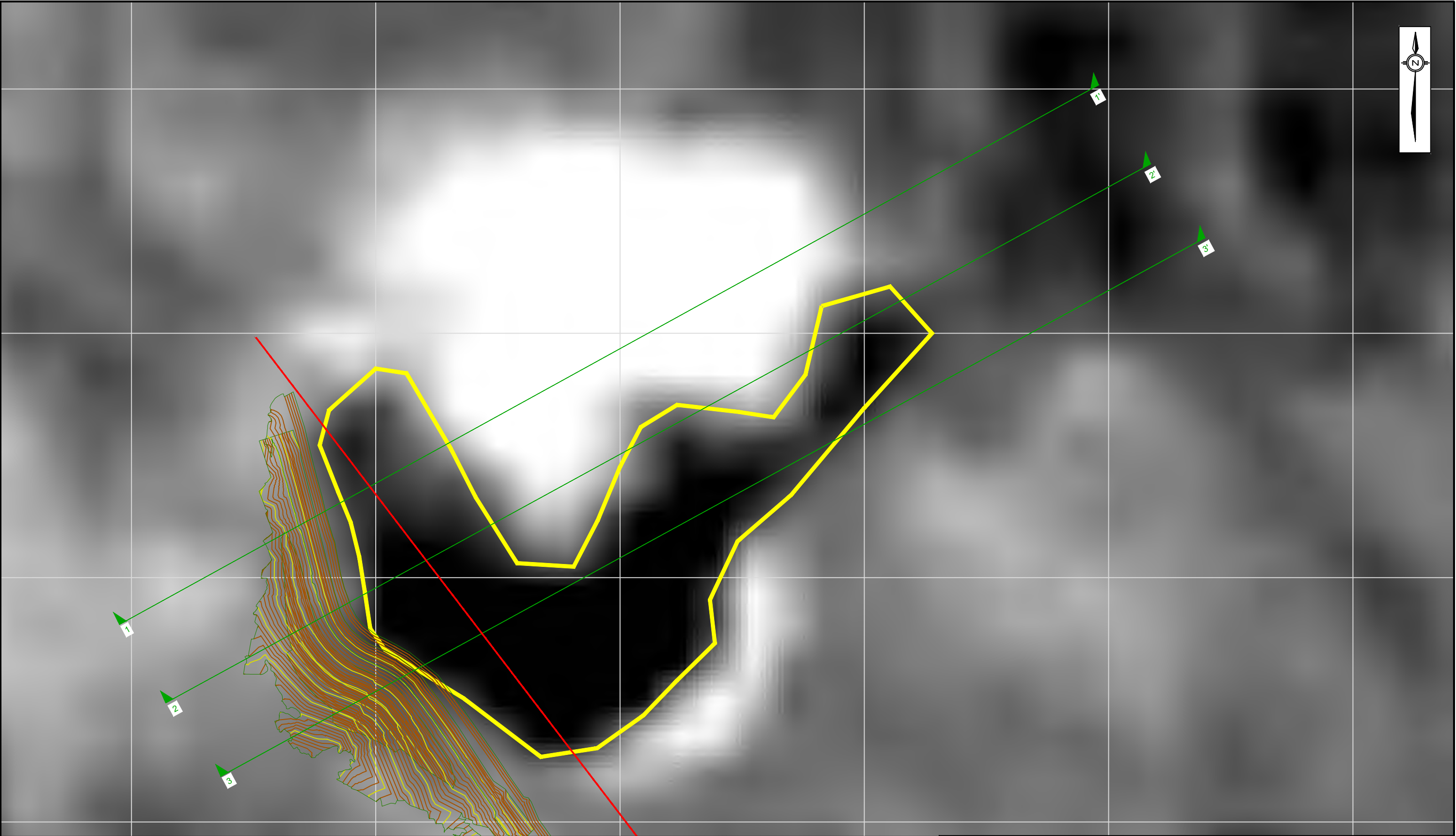
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>FEBRUARY 7, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-24                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

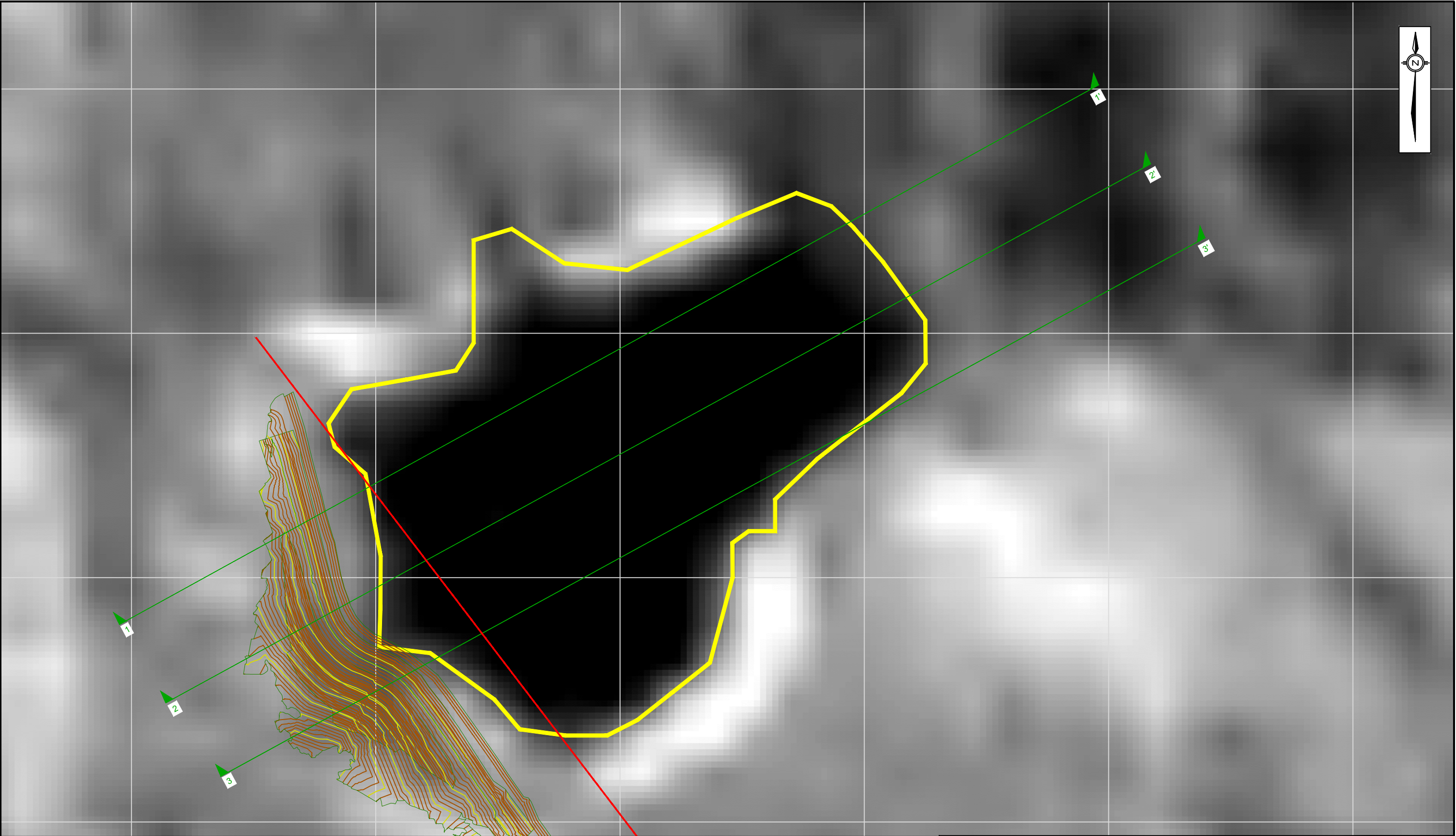
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                  |                          |                                                                                                                       |  |
|------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------|--|
| CLIENT           |                          | PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |  |
|                  |                          | TITLE<br>SATELLITE IMAGES<br>APRIL 28, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                    |  |
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-25                                                                                               |  |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

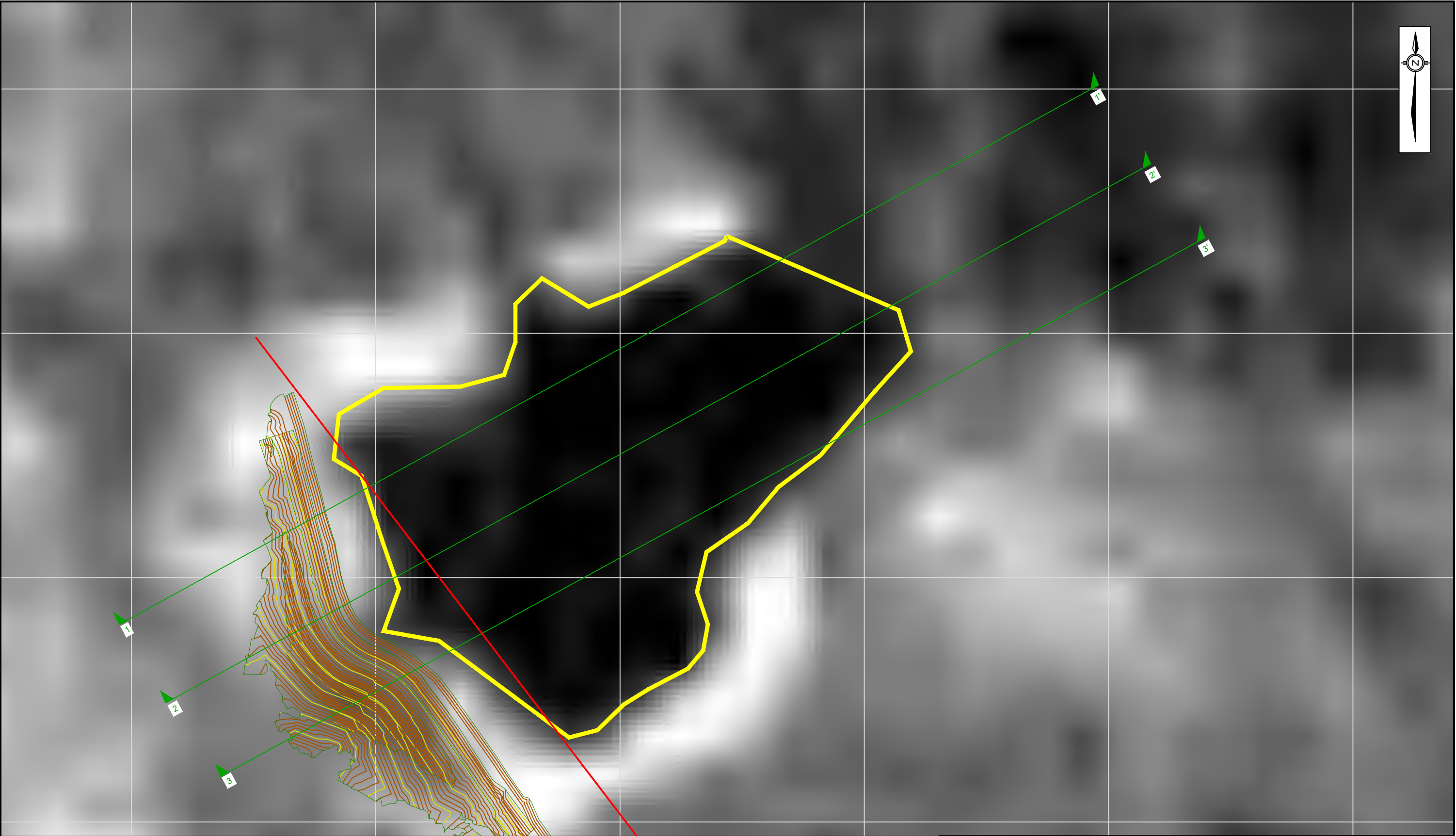
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |             |                                                                                                            |
|---------|-------------|------------------------------------------------------------------------------------------------------------|
| CLIENT  |             | PROJECT                                                                                                    |
|         |             | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |
|         |             | TITLE                                                                                                      |
|         |             | SATELLITE IMAGES<br>JUNE 15, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                   |
| SCALE   | PROJECT No. | FIG. No.                                                                                                   |
| 1:3,000 | A03355A02   | FIGURE I-26                                                                                                |





**NOTES:**

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- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

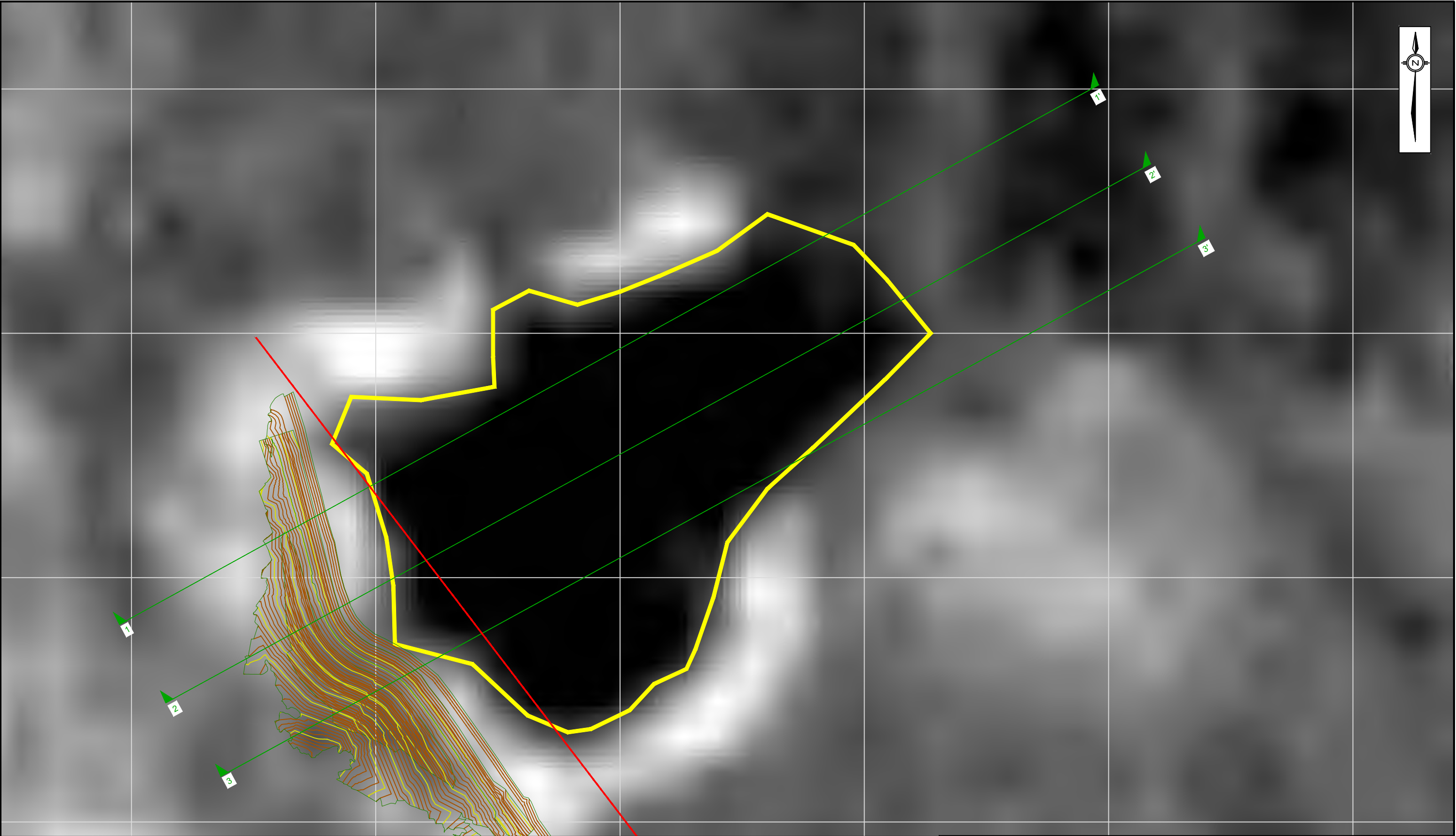
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JULY 1, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                    |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-27                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

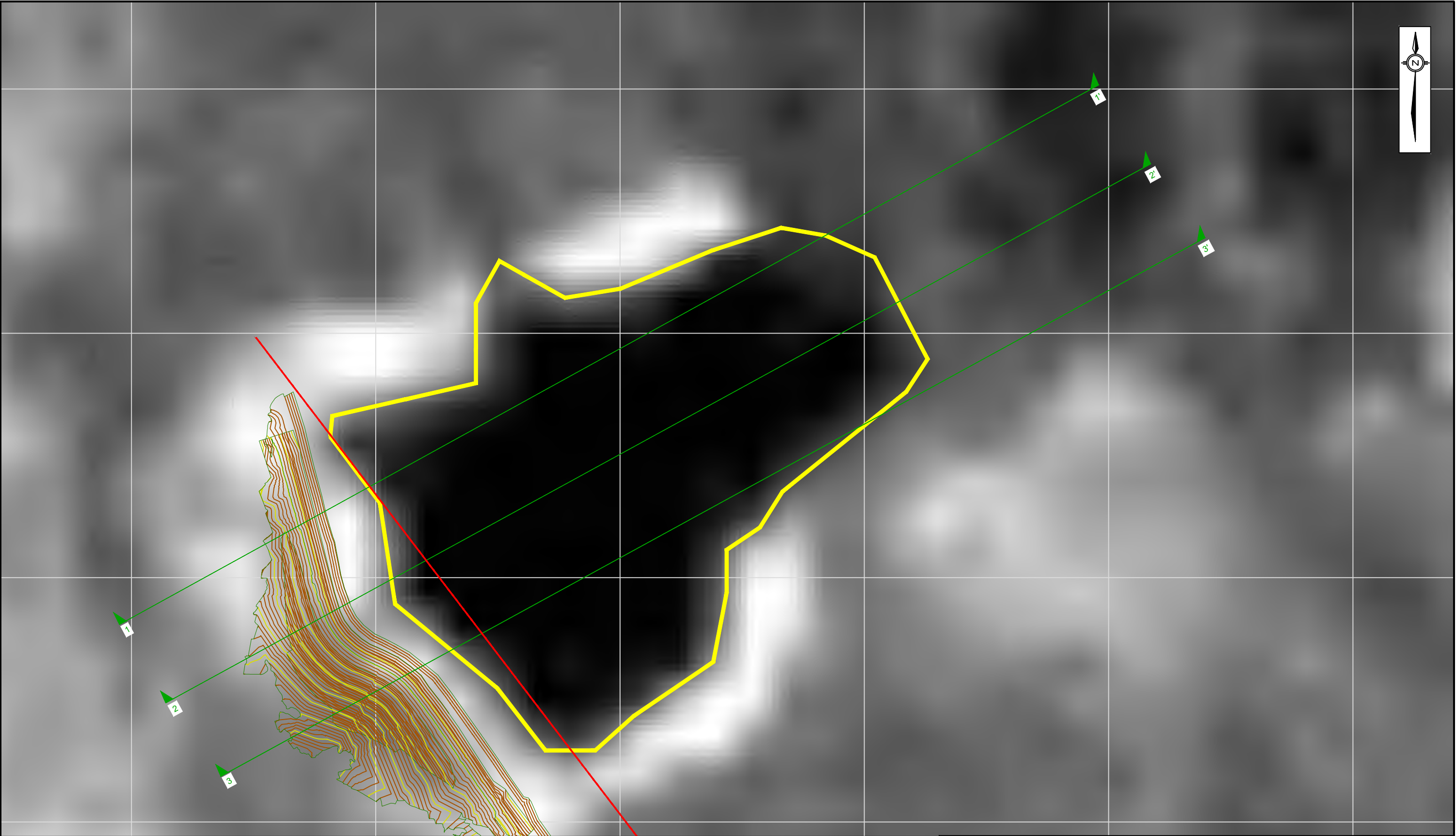
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
JULY 17, 1987 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-28 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

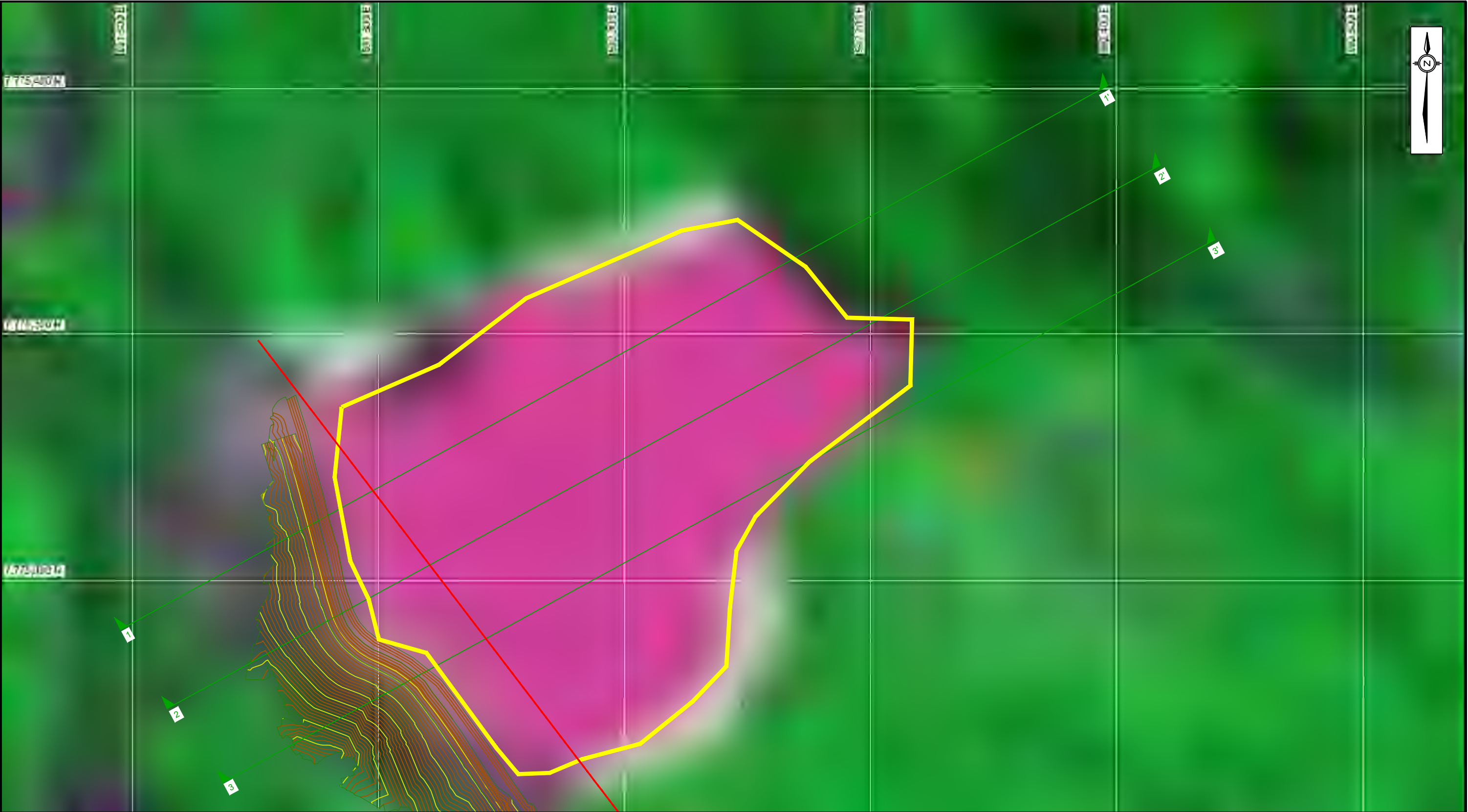
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 2, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                  |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-29                                                                                                |             |



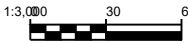


**NOTES:**

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
2. ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
3. SINCE WATER ABSORBS NEAR-INFRARED LIGHT, WATER OR DAMP AREAS WILL LOOK RED IN A RED-NIR-GREEN IMAGE
4. ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
5. IMAGES WITH (S) IN THE TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

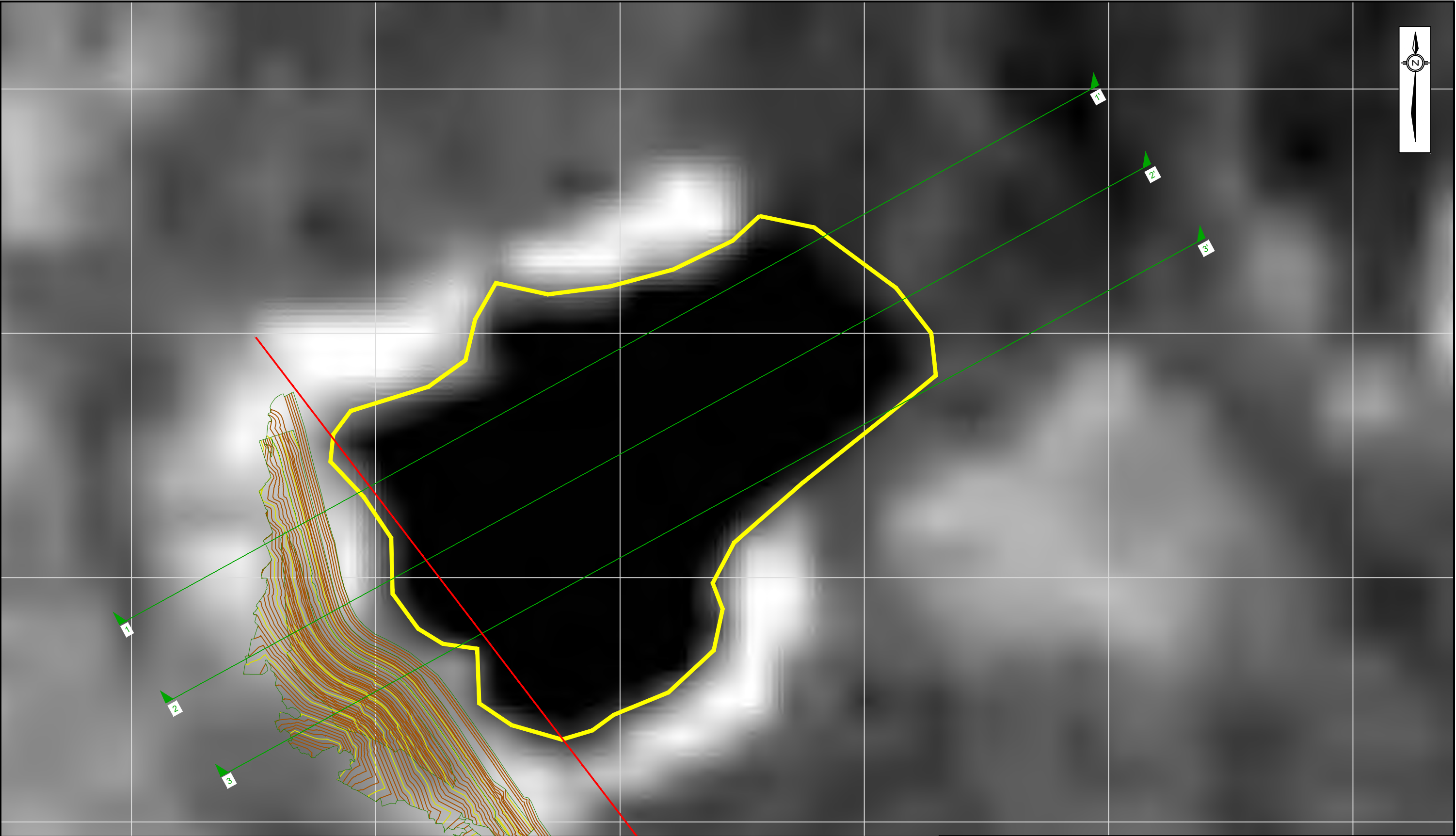
- |                                               |                     |
|-----------------------------------------------|---------------------|
| — DESIGN SECTIONS                             | — 1 m CONTOURS      |
| — POND OUTLINE                                | — 5 m CONTOURS      |
| — MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | — DAM RAISE OUTLINE |



BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |             |
|---------|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT  | PROJECT                                                                                                    |             |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
|         | TITLE                                                                                                      |             |
|         | SATELLITE IMAGES<br>1987<br>RAISE #5<br>DAM CREST EL. 889 m                                                |             |
| SCALE   | PROJECT No.                                                                                                | FIG. No.    |
| 1:3,000 | A03355A02                                                                                                  | FIGURE I-30 |

RGB-IR-G-L



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

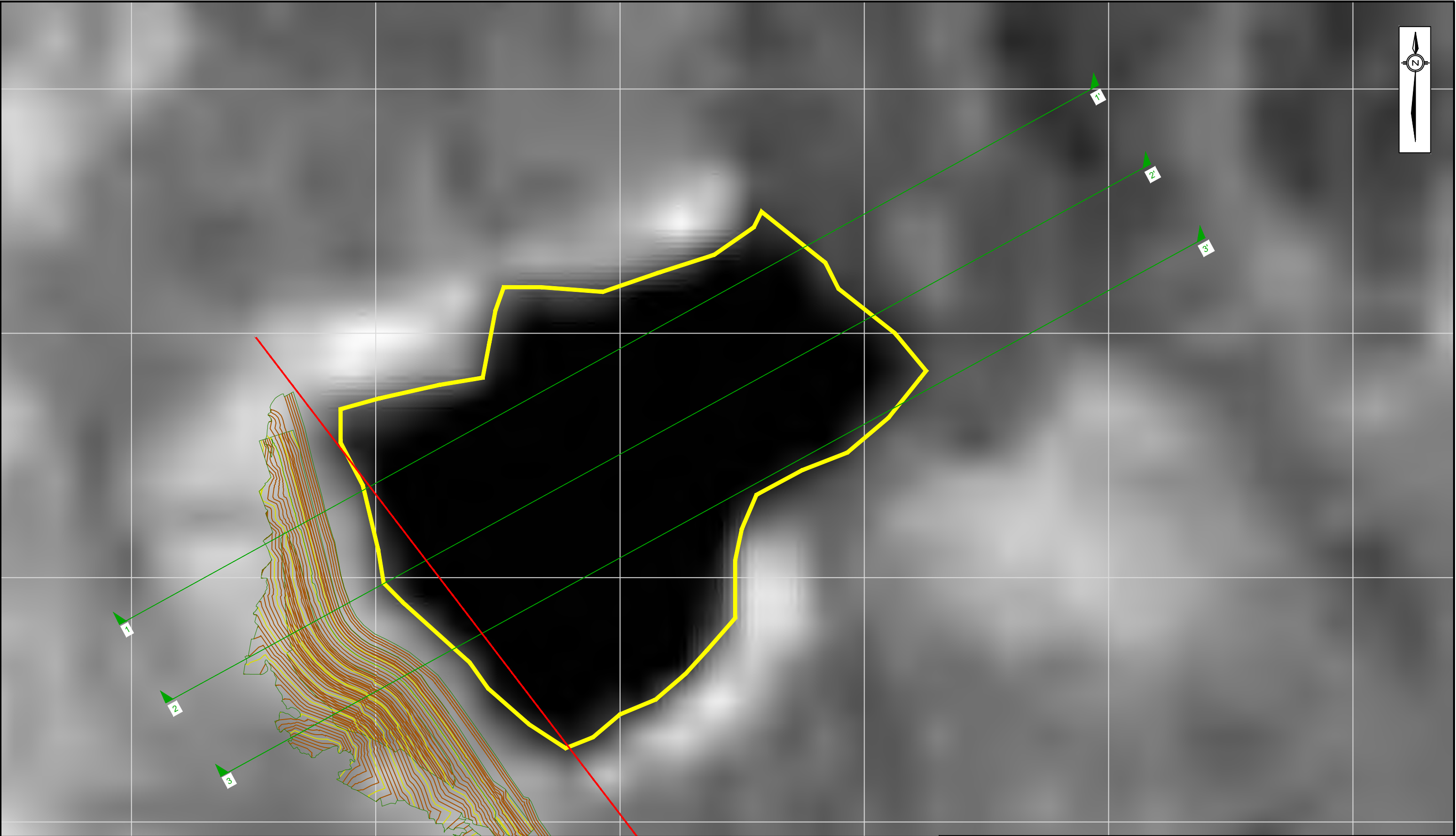
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>SEPTEMBER 3, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                               |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-31                                                                                    |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT

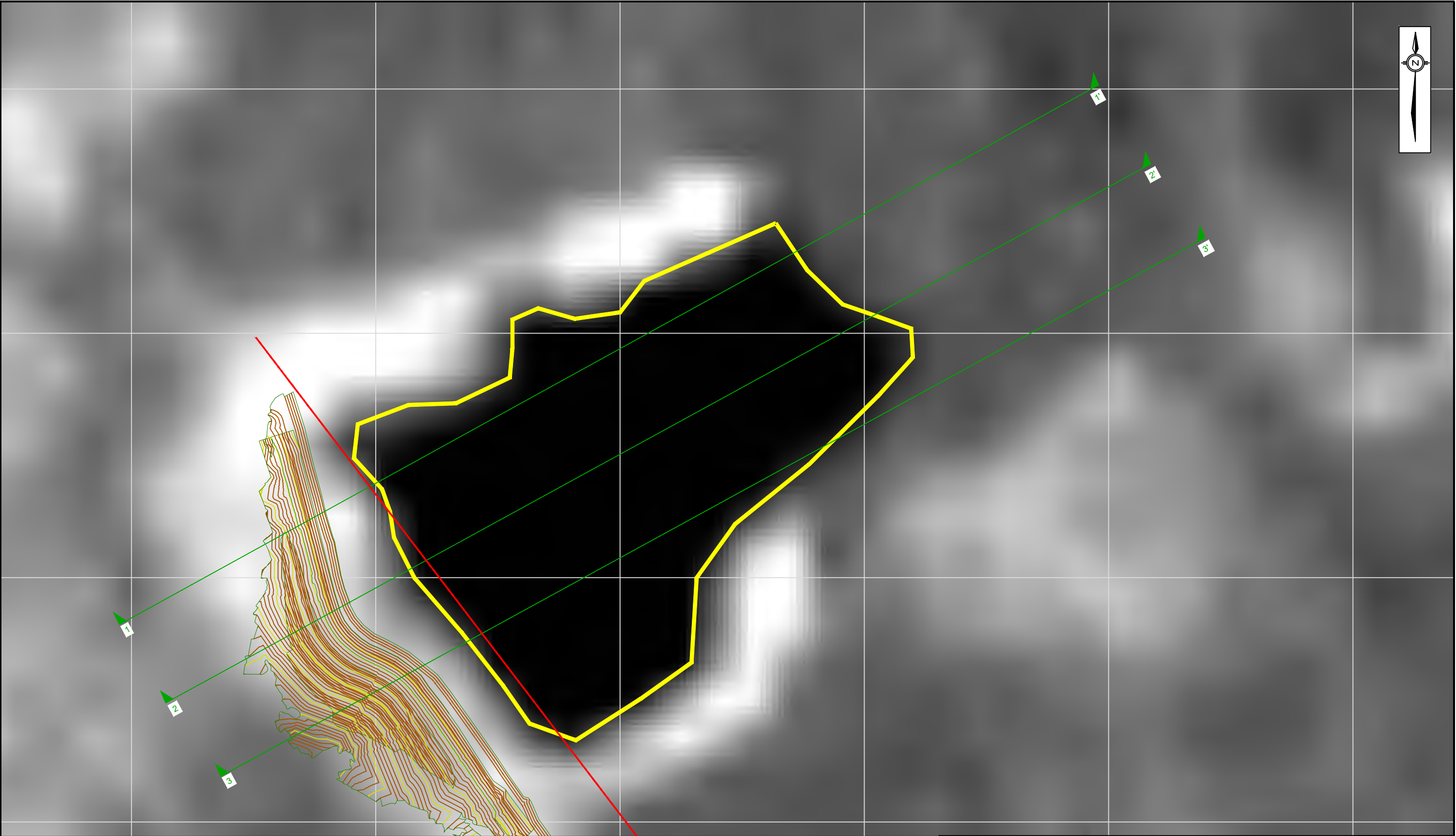
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
SEPTEMBER 19, 1987 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I- 32 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

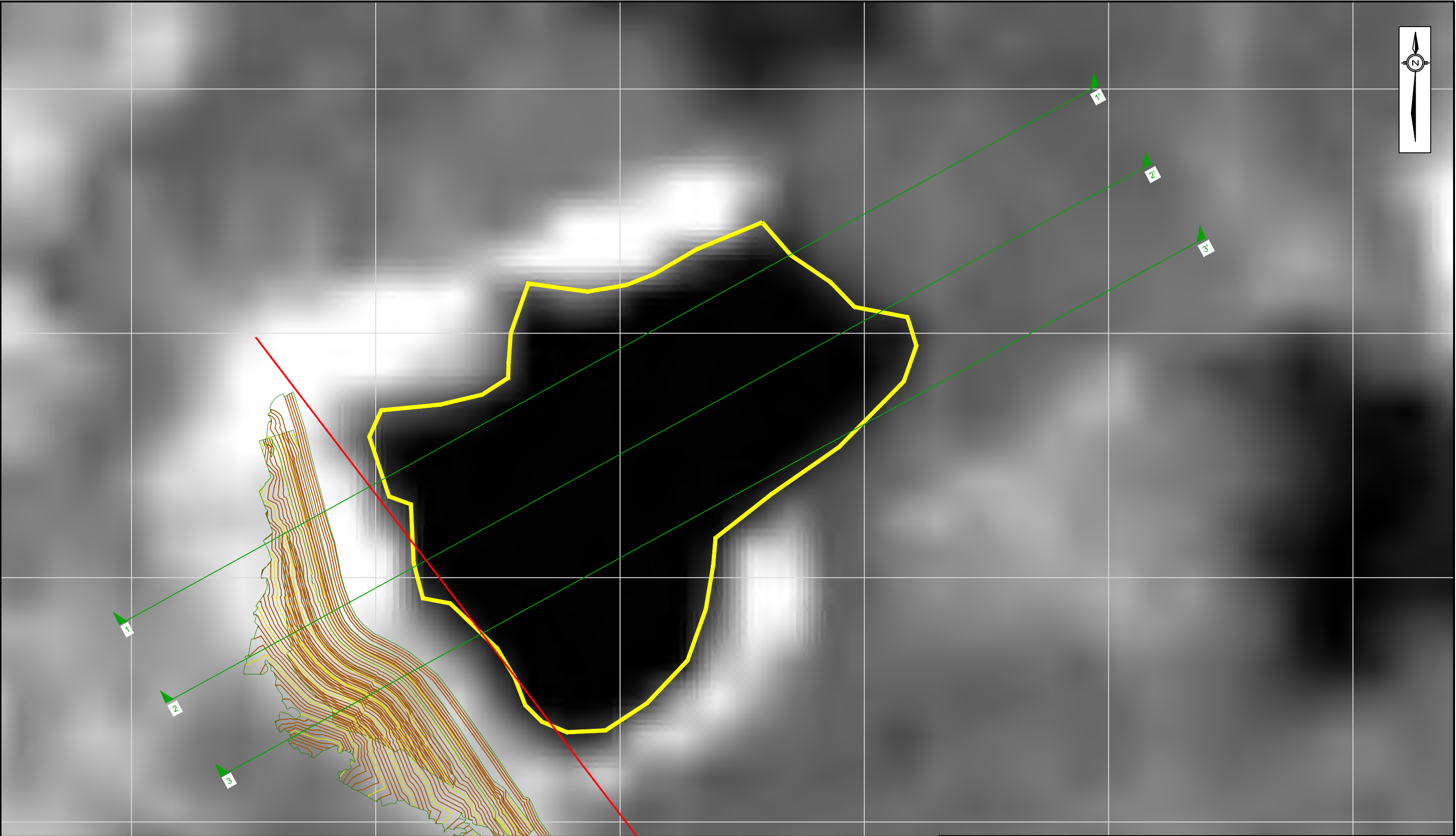
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>OCTOBER 5, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-33                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

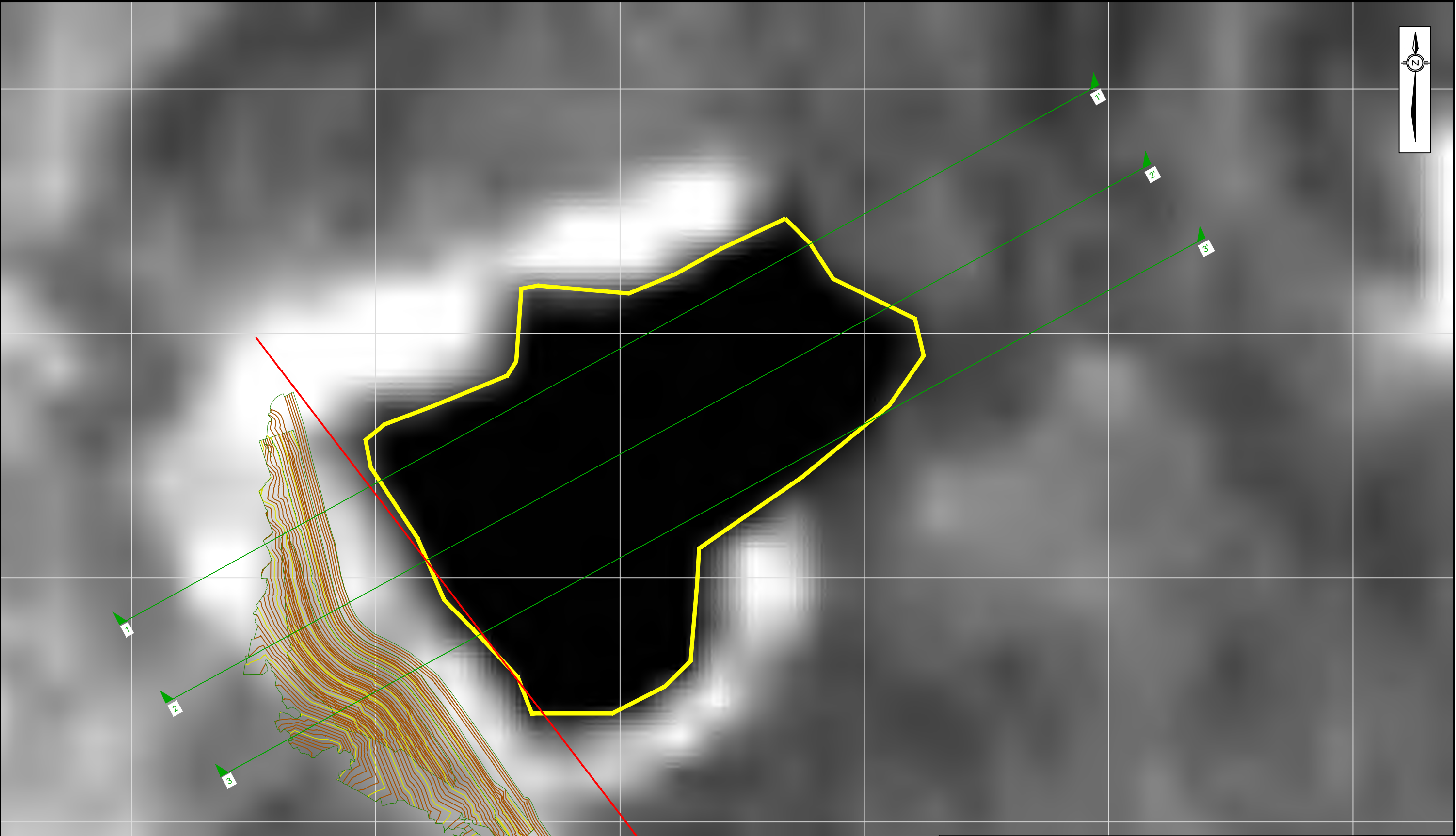
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------|
| CLIENT  | PROJECT                                                                                                    |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |
|         | TITLE                                                                                                      |
|         | SATELLITE IMAGES<br>NOVEMBER 22, 1987 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                               |
| SCALE   | PROJECT No.                                                                                                |
| 1:3,000 | A03355A02                                                                                                  |
|         | FIG. No.                                                                                                   |
|         | FIGURE I-34                                                                                                |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

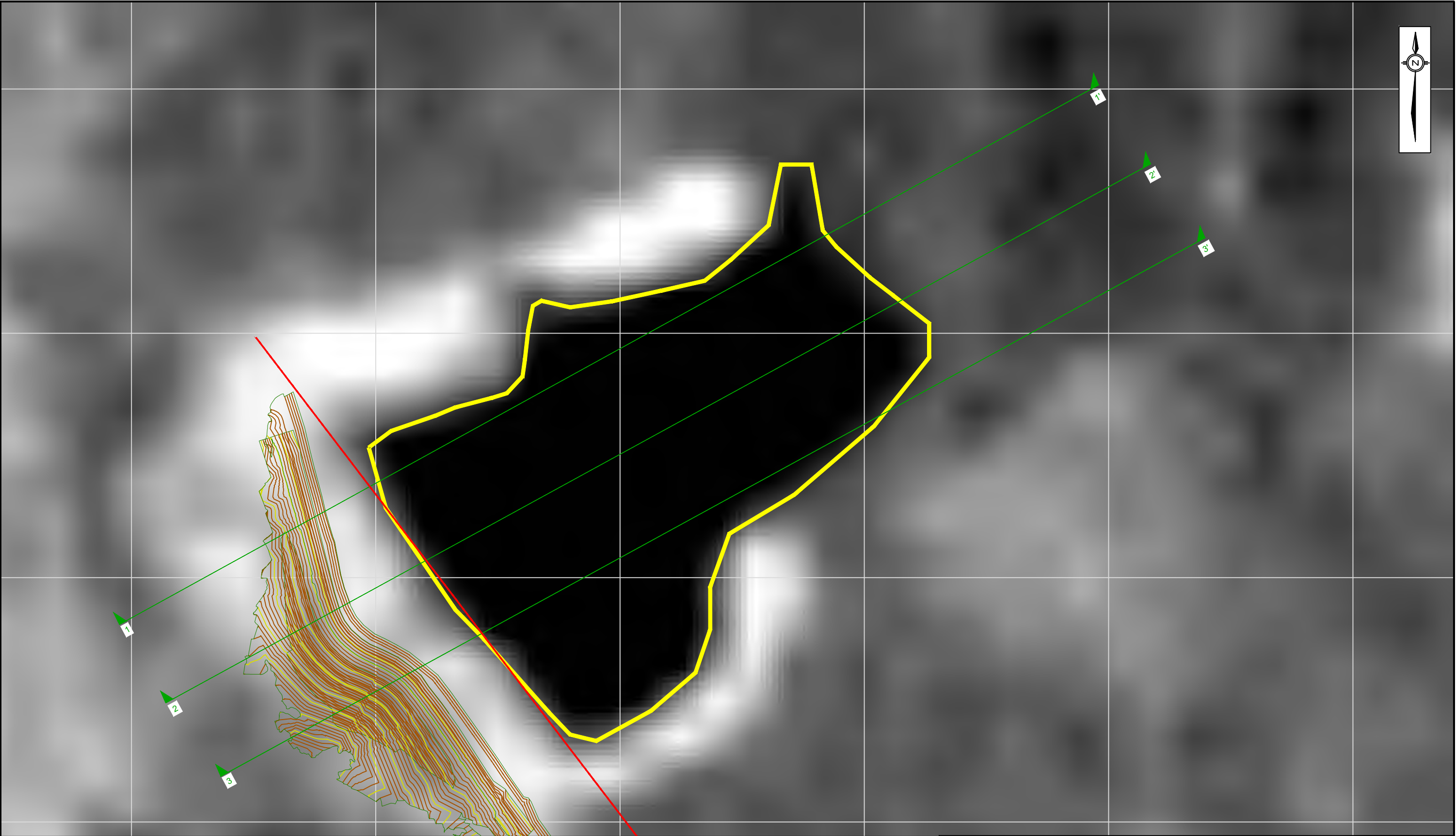
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JANUARY 25, 1988 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-35                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

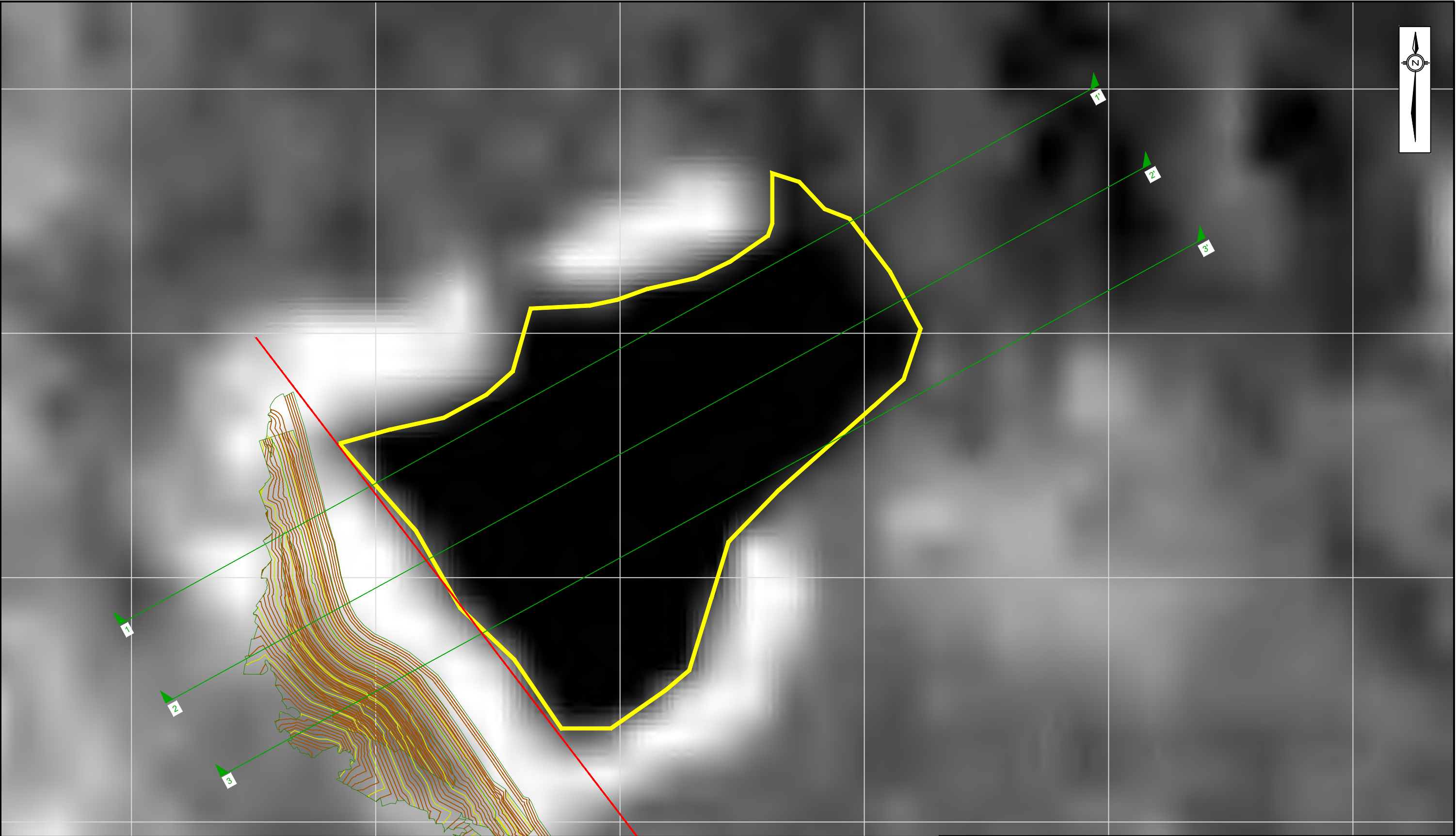
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |             |
|---------|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT  | PROJECT                                                                                                    |             |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
|         | TITLE                                                                                                      |             |
|         | SATELLITE IMAGES<br>MARCH 29, 1988 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                  |             |
| SCALE   | PROJECT No.                                                                                                | FIG. No.    |
| 1:3,000 | A03355A02                                                                                                  | FIGURE I-36 |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

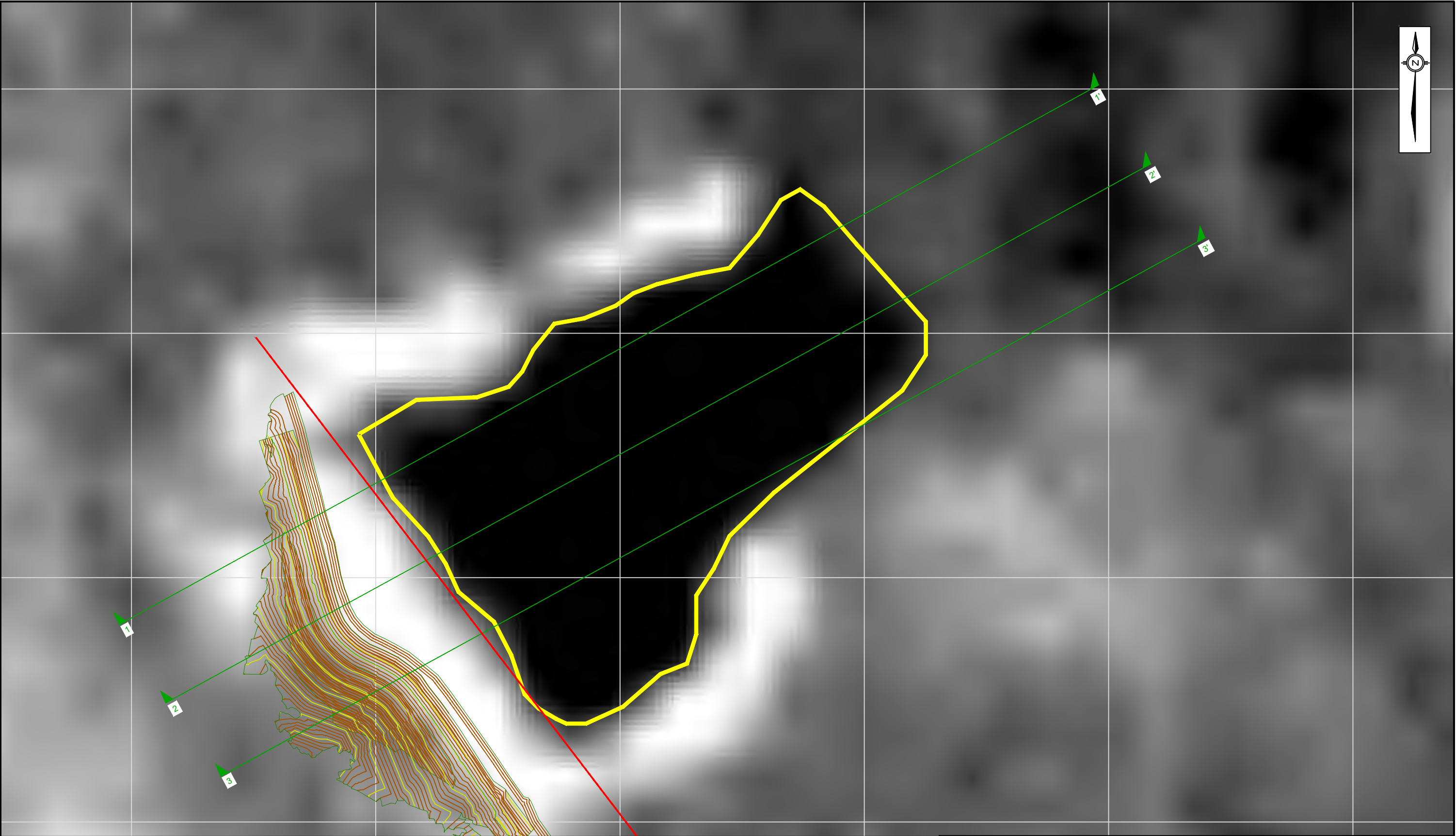
PROJECT

REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
APRIL 30, 1988 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-37 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

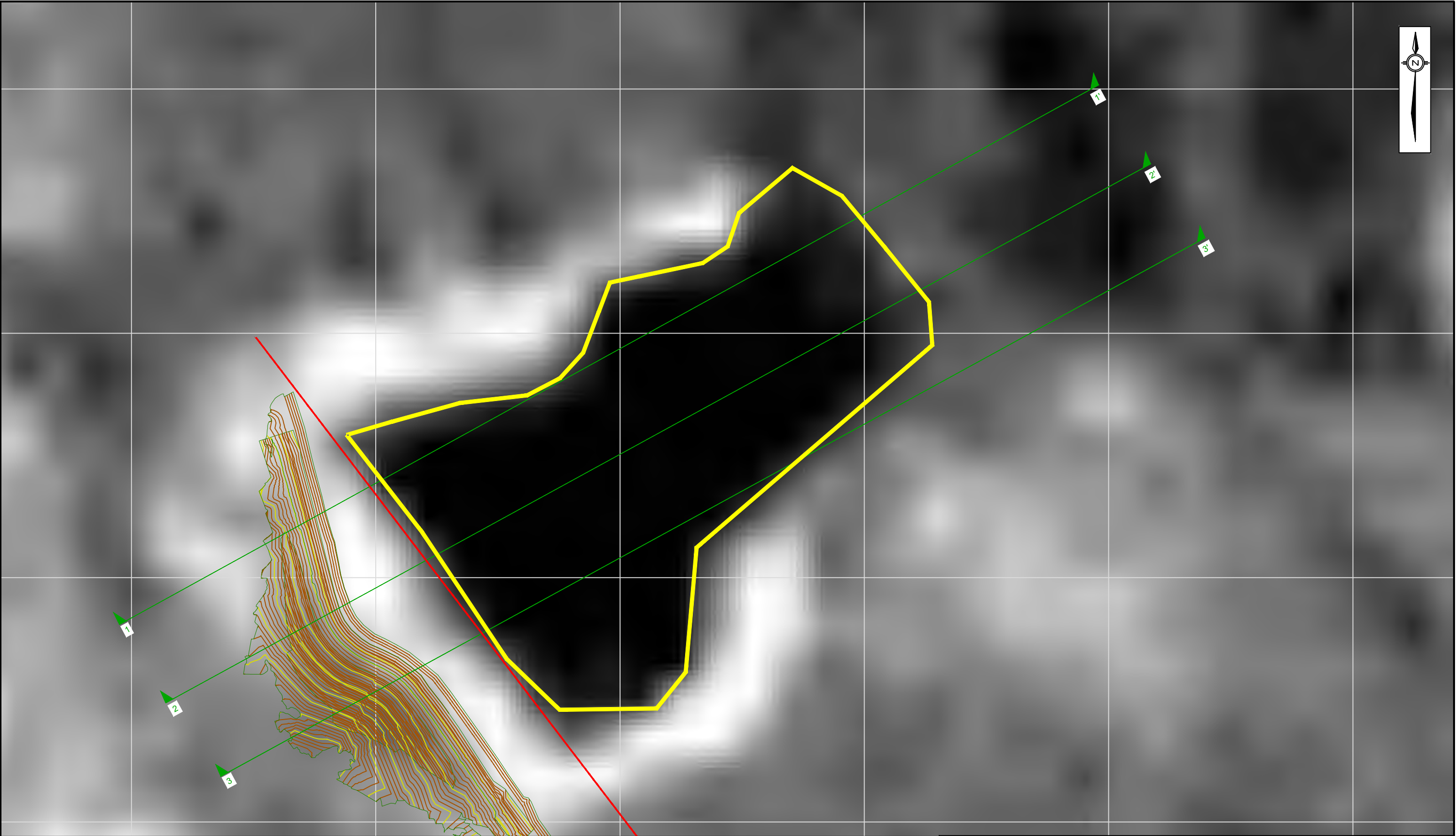
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |             |
|---------|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT  | PROJECT                                                                                                    |             |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
|         | TITLE                                                                                                      |             |
|         | SATELLITE IMAGES<br>MAY 16, 1988 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                    |             |
| SCALE   | PROJECT No.                                                                                                | FIG. No.    |
| 1:3,000 | A03355A02                                                                                                  | FIGURE I-38 |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

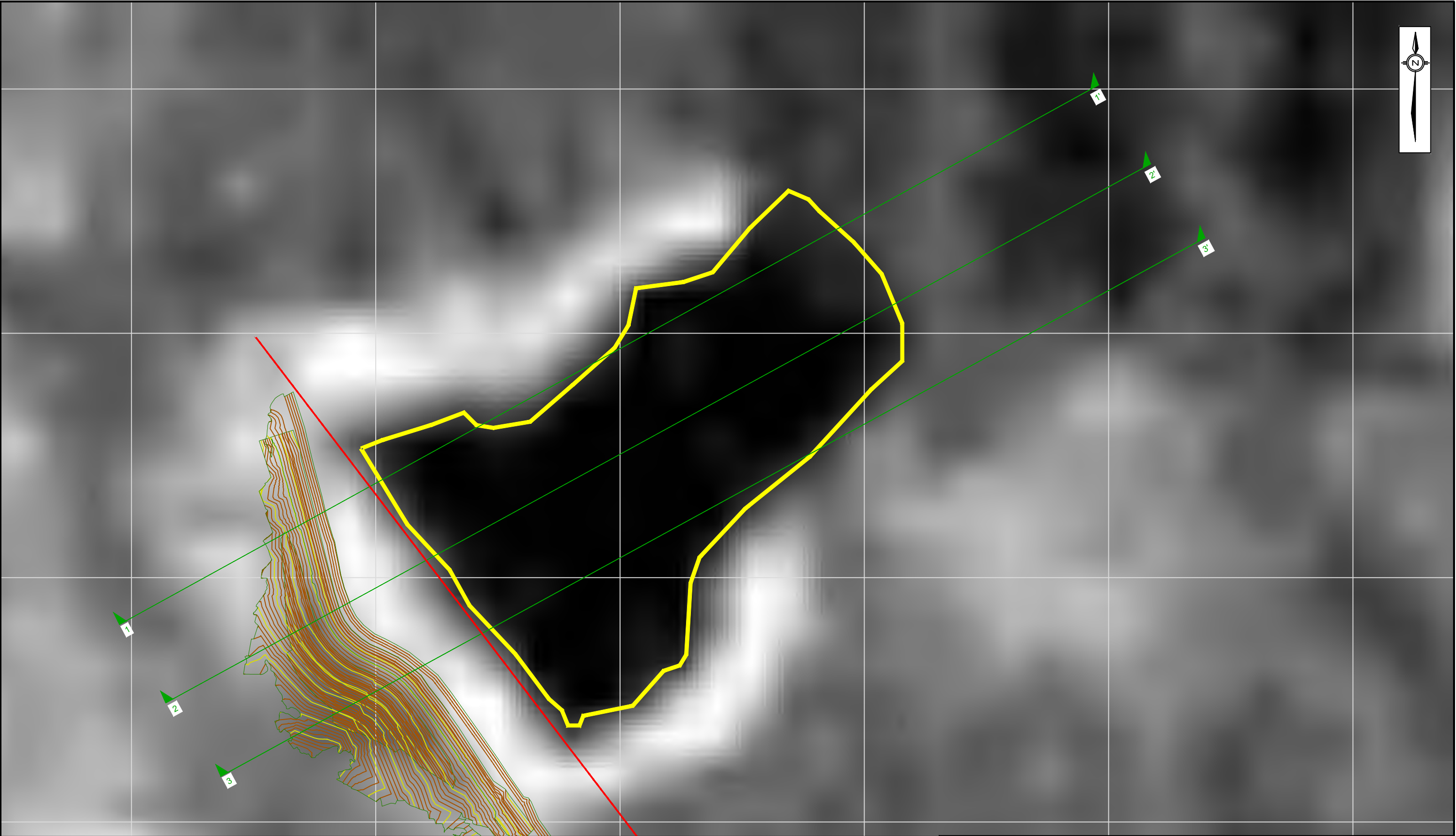
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>JUNE 17, 1988 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                   |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-39                                                                                    |                          |





**NOTES:**

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- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

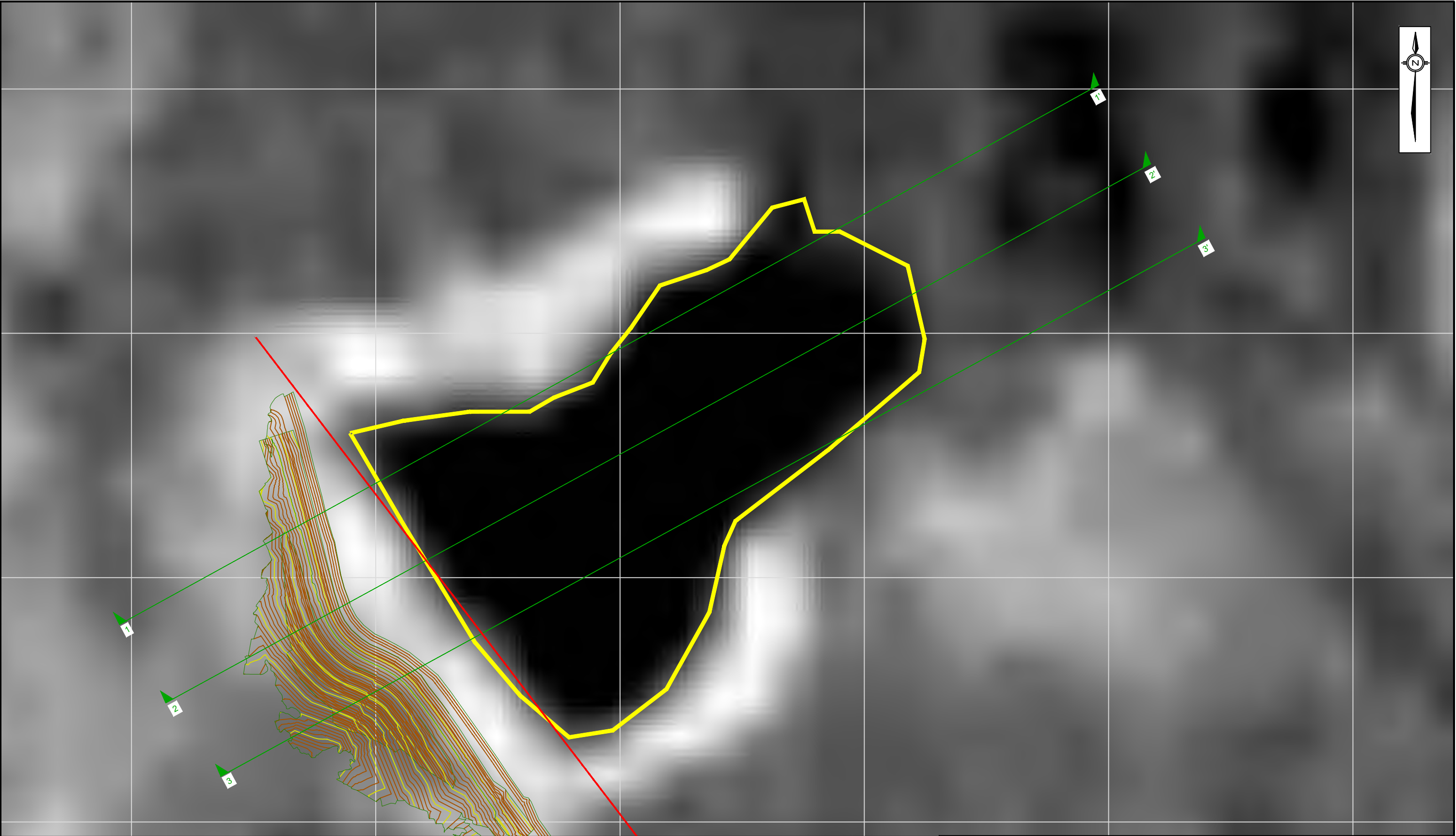
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>JULY 19, 1988 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                   |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-40                                                                                    |                          |





**NOTES:**

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- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

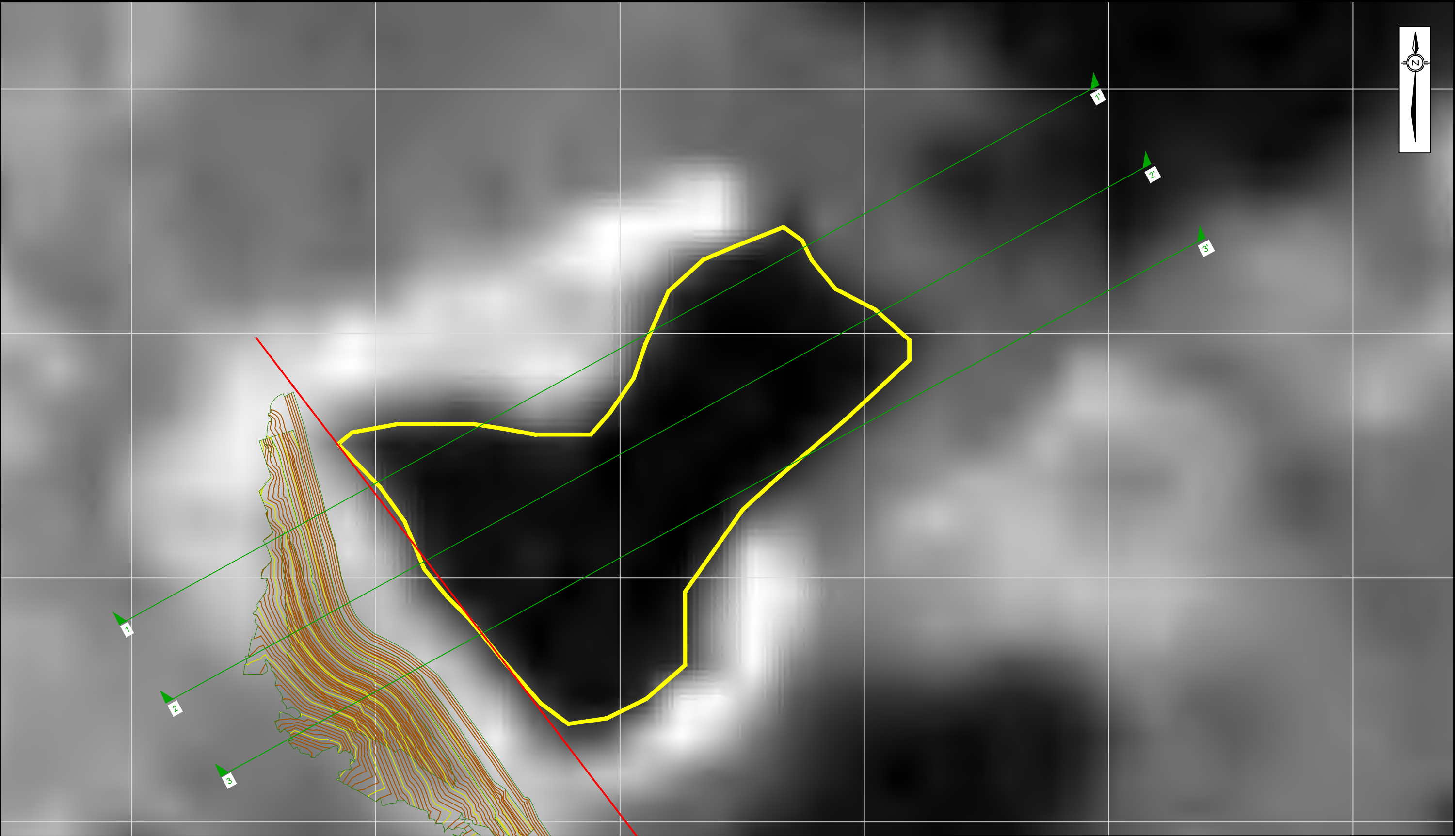
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 4, 1988 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                  |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-41                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

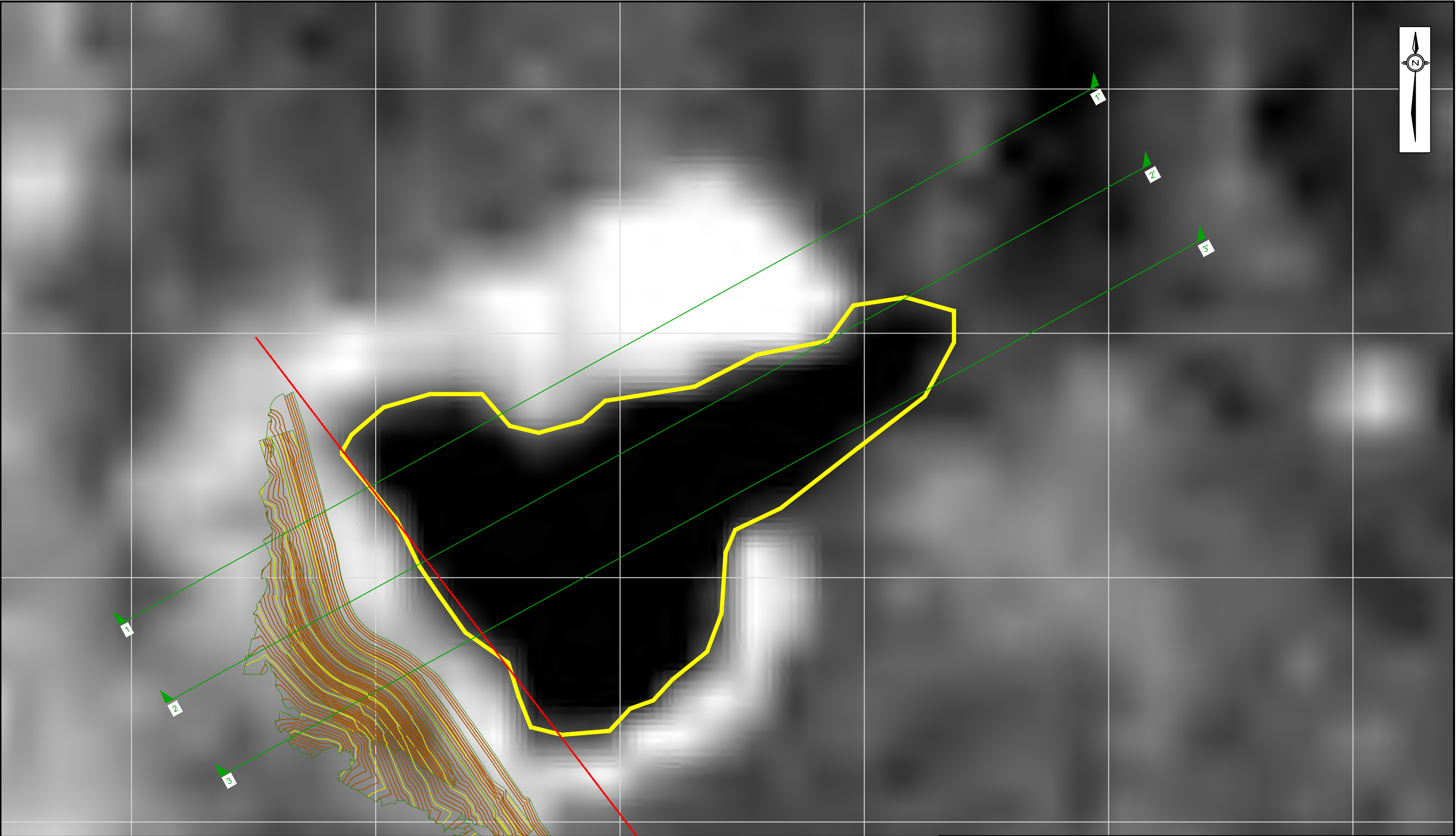
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
SEPTEMBER 21, 1988 (S)  
RAISE #5  
DAM CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-42 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

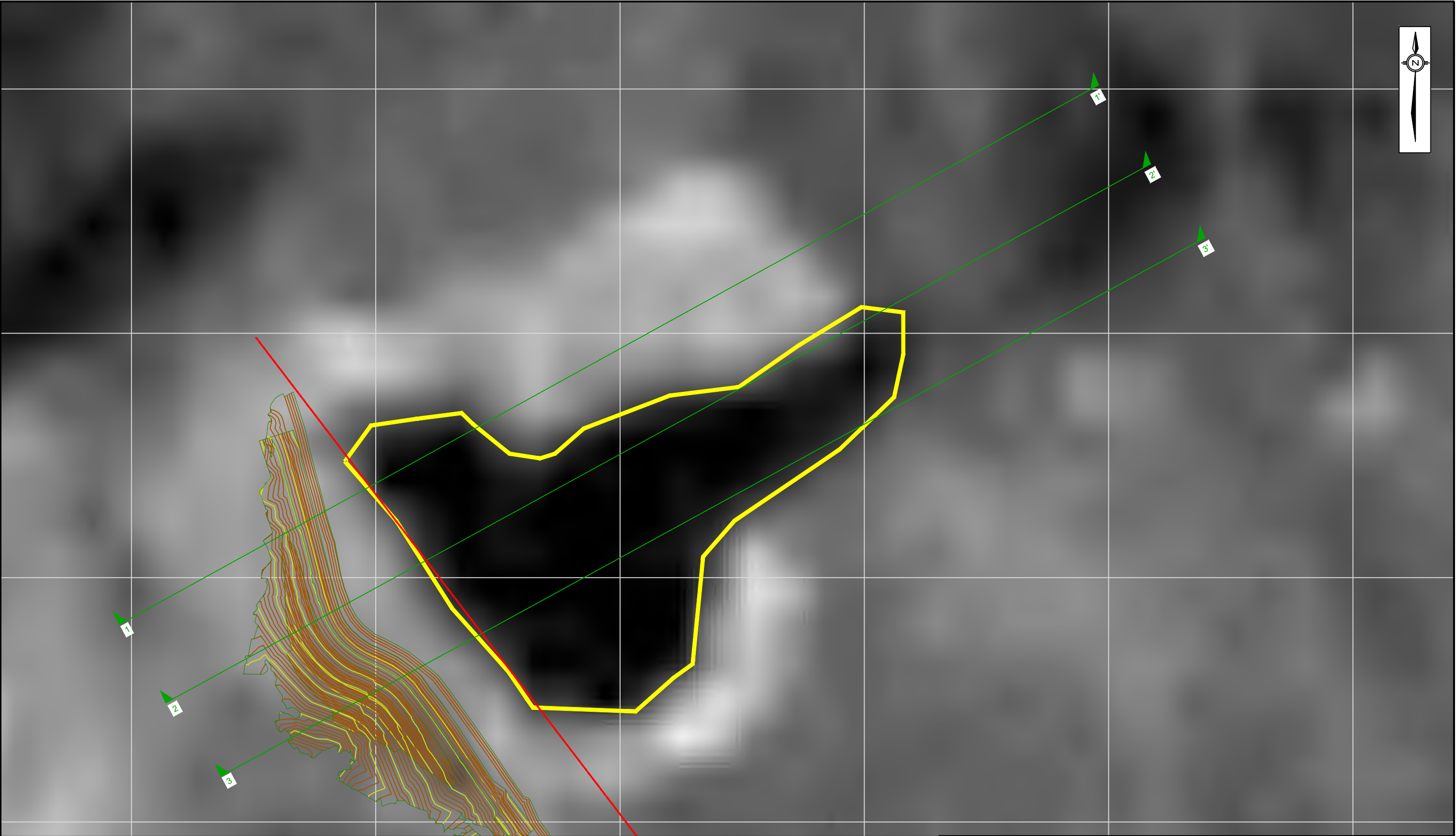
|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>APRIL 1, 1989 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                   |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-43                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

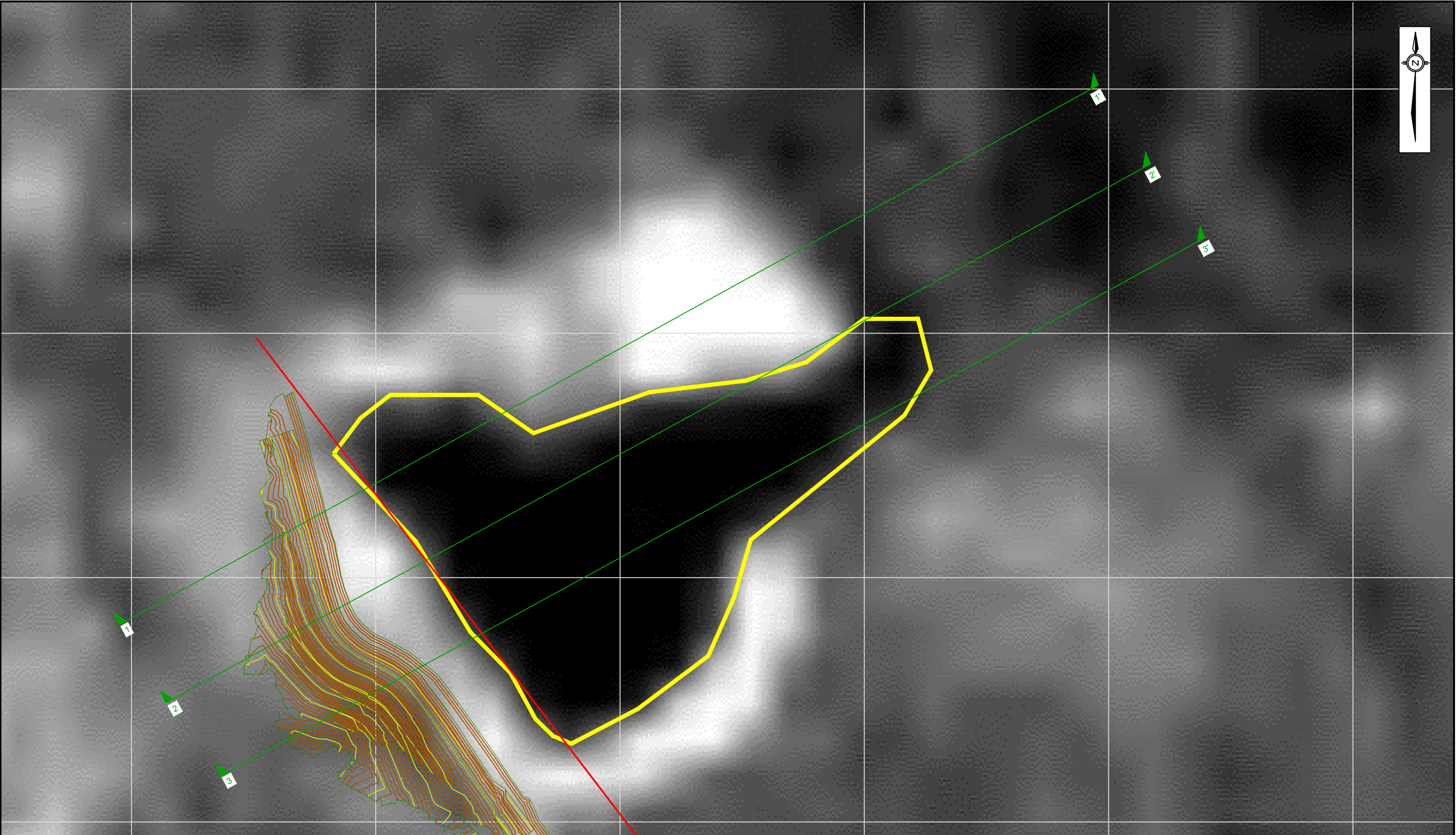
1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |             |                                                                                                            |
|---------|-------------|------------------------------------------------------------------------------------------------------------|
| CLIENT  |             | PROJECT                                                                                                    |
|         |             | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |
|         |             | TITLE                                                                                                      |
|         |             | SATELLITE IMAGES<br>APRIL 17, 1989 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                  |
| SCALE   | PROJECT No. | FIG. No.                                                                                                   |
| 1:3,000 | A03355A02   | FIGURE I-44                                                                                                |

ROB-FIG-4





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

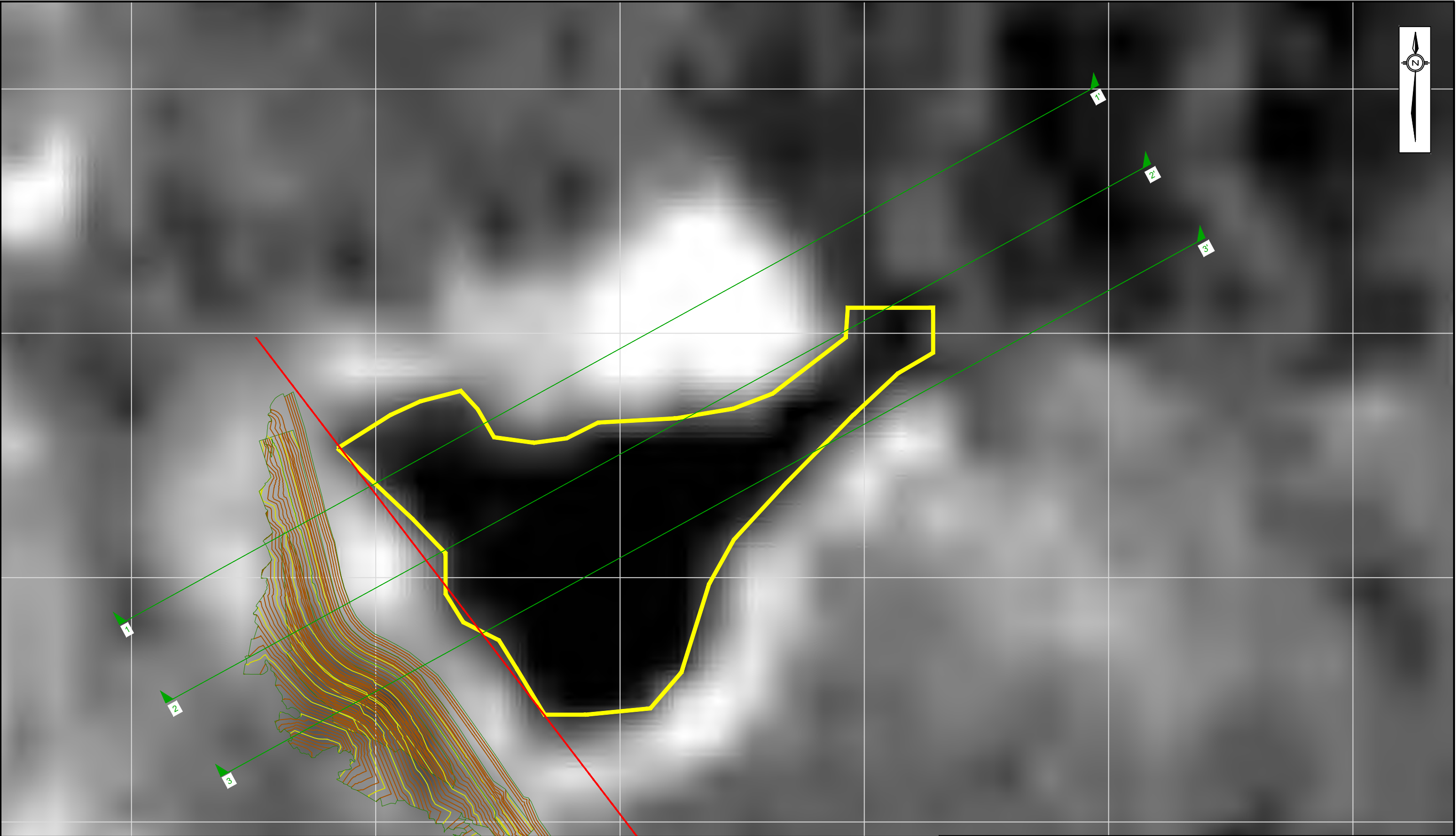
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>MAY 19, 1989 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                    |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-45                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

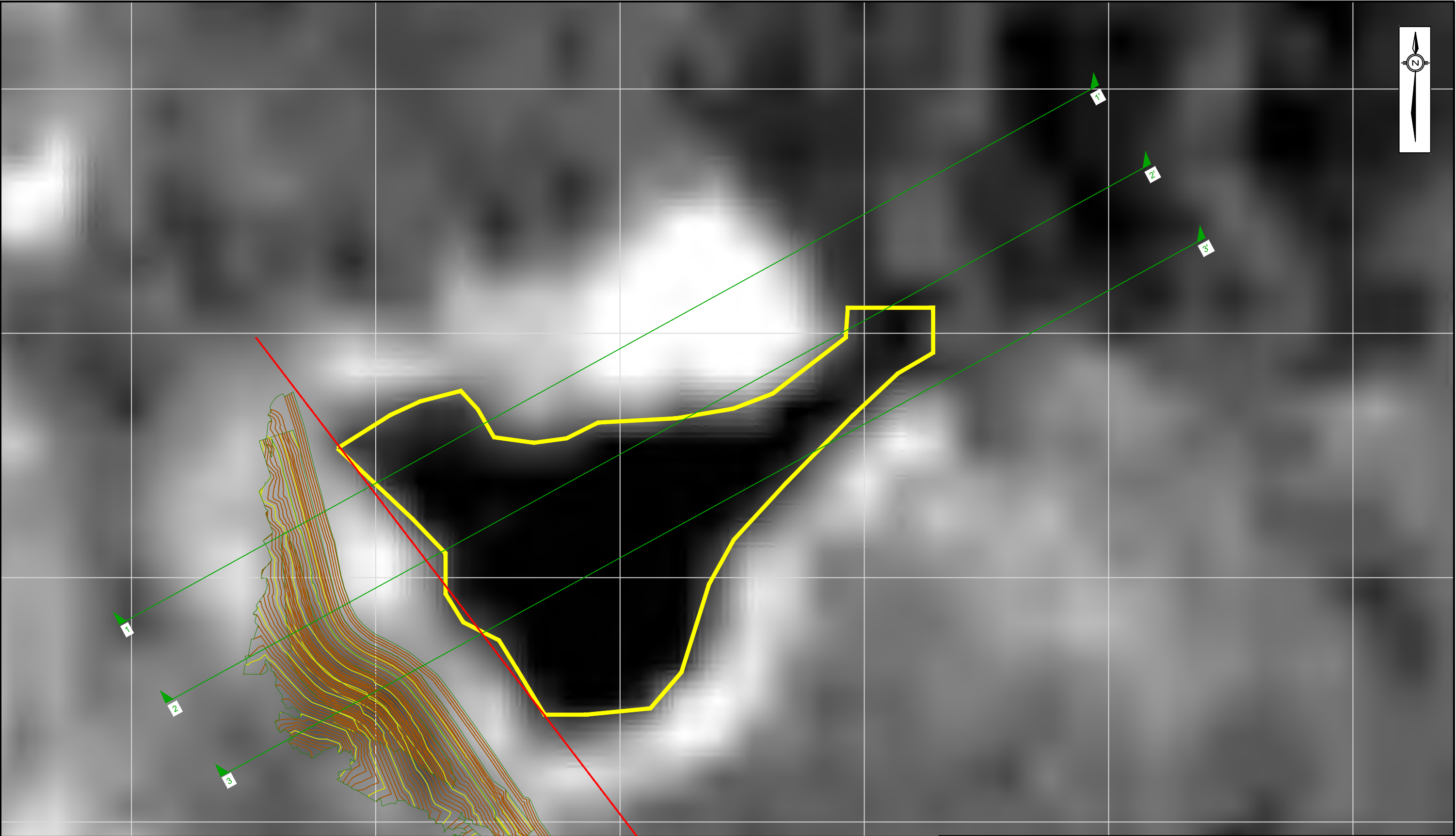
PROJECT

REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
JUNE 4, 1989 (S)  
RAISE #5  
DAN CREST EL. 889 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-46 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

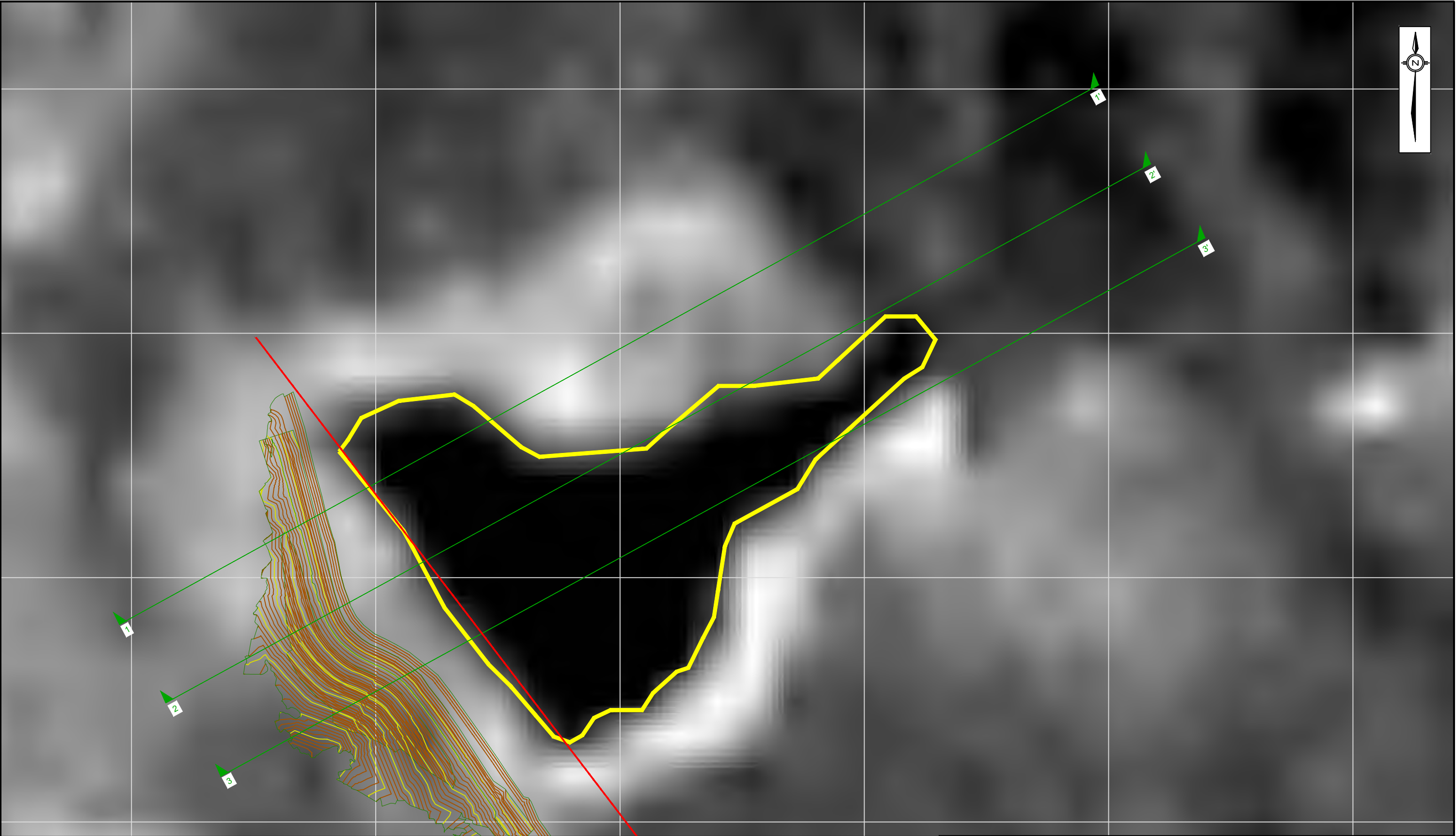
1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>JUNE 20, 1989 (S)<br>RAISE #5<br>DAN CREST EL. 889 m                                   |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-47                                                                                    |                          |

ROB-11GB-L





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

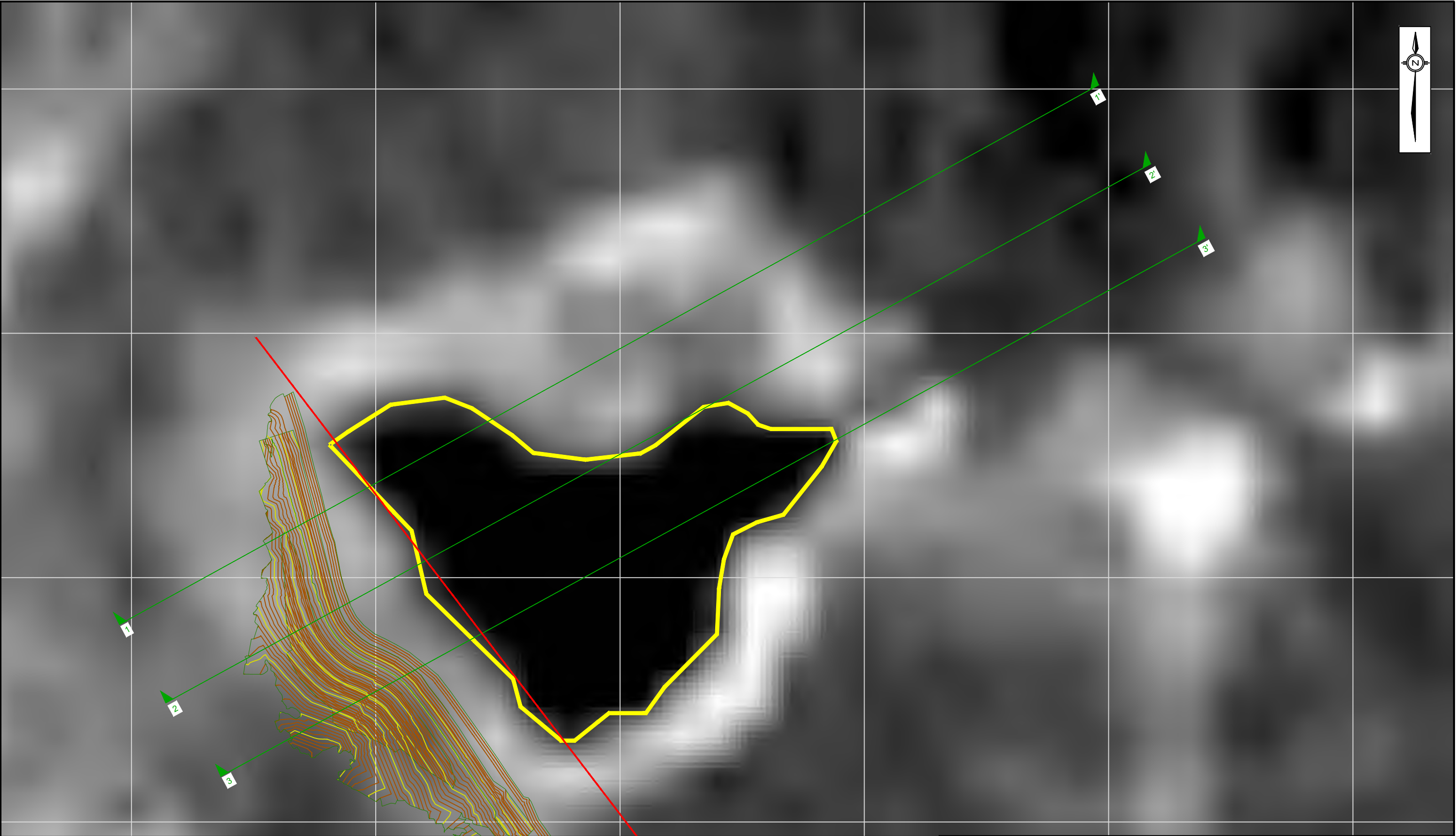
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |             |
|---------|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT  | PROJECT                                                                                                    |             |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
|         | TITLE                                                                                                      |             |
|         | SATELLITE IMAGES<br>AUGUST 23, 1989 (S)<br>RAISE #5<br>DAM CRET EL. 889 m                                  |             |
| SCALE   | PROJECT No.                                                                                                | FIG. No.    |
| 1:3,000 | A03355A02                                                                                                  | FIGURE I-48 |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

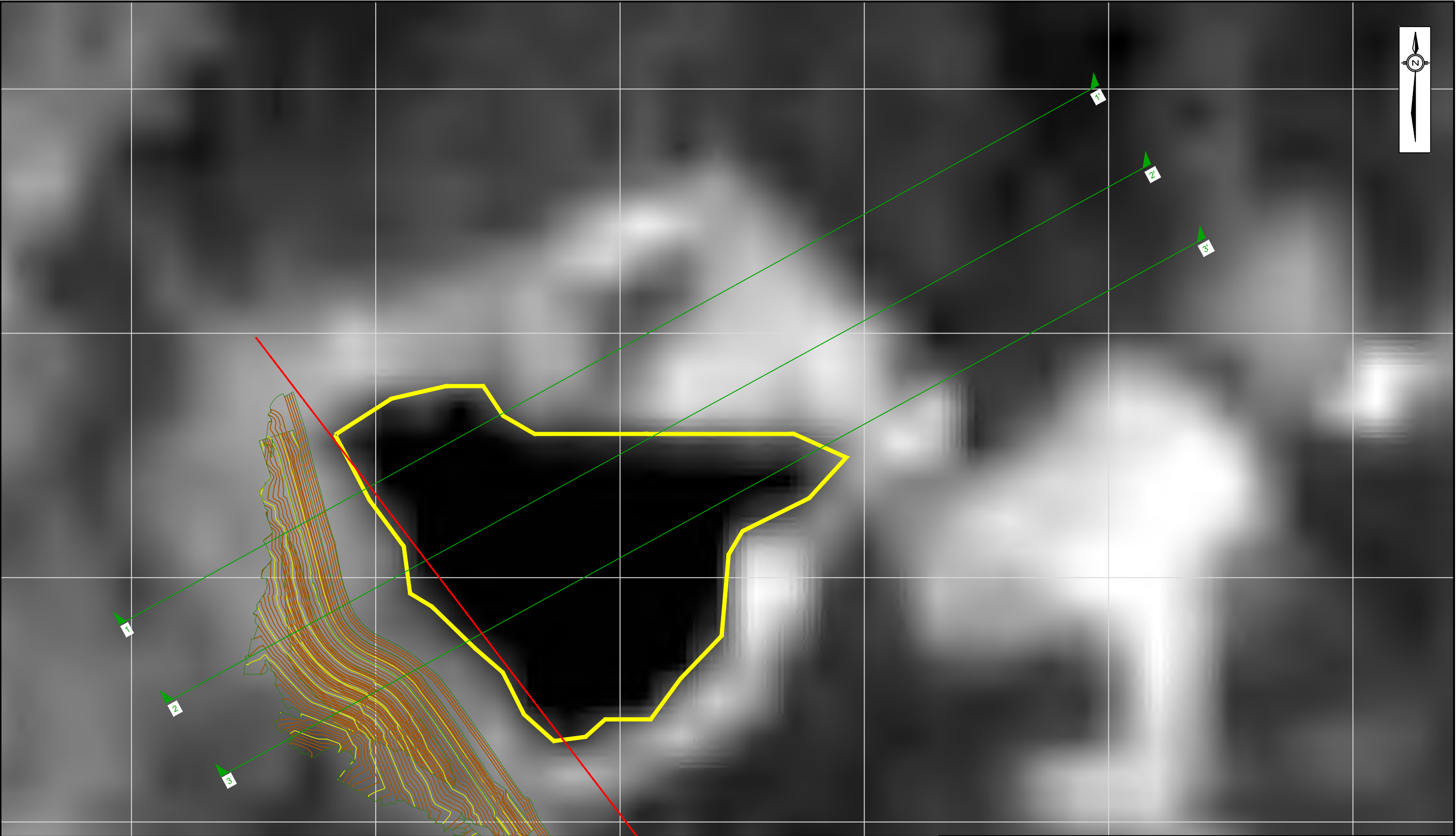
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>SEPTEMBER 24, 1989 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                              |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-49                                                                                    |                          |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

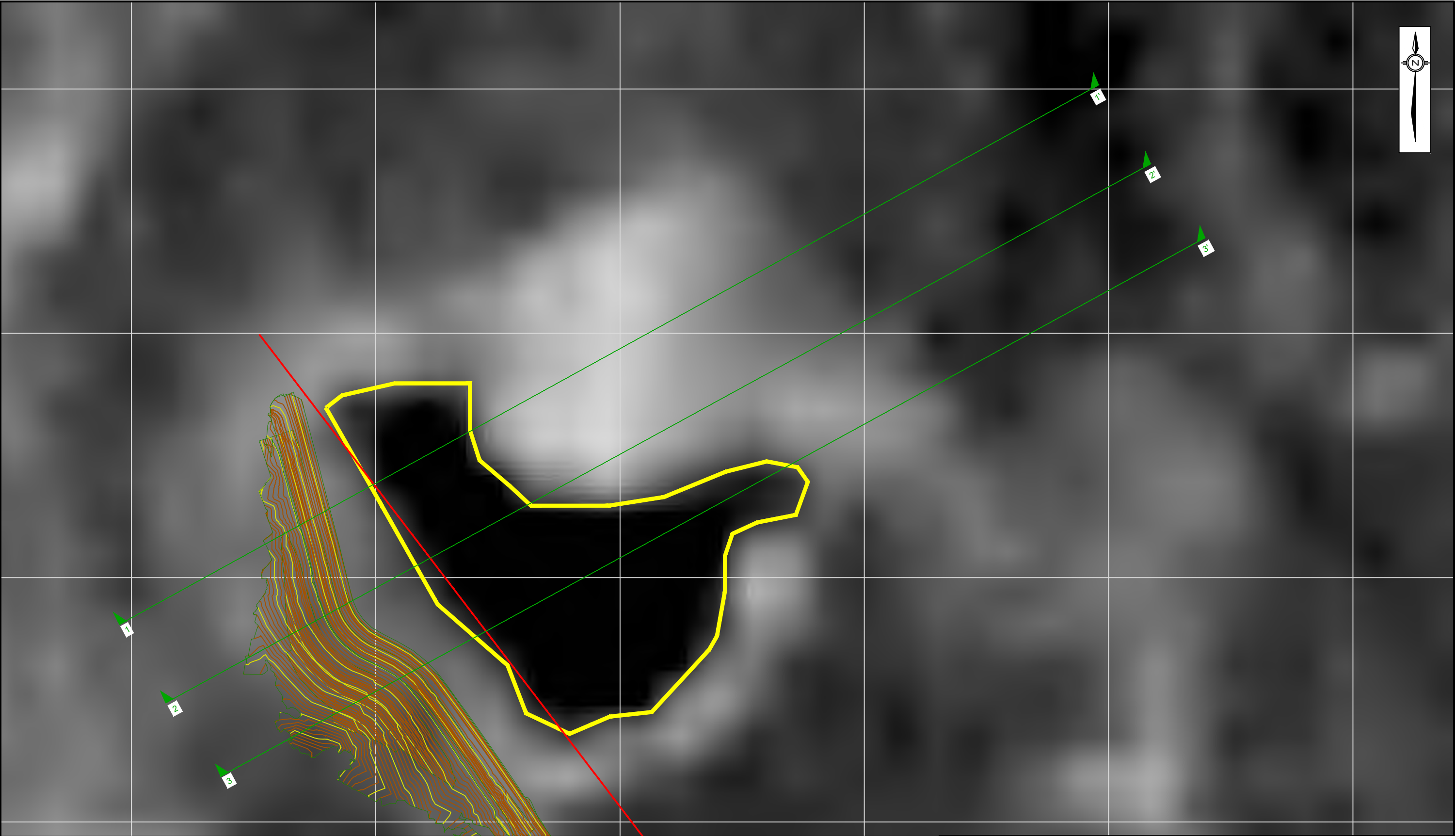
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 5) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>OCTOBER 26, 1989 (S)<br>RAISE #5<br>DAM CREST EL. 889 m                                |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-50                                                                                    |                          |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

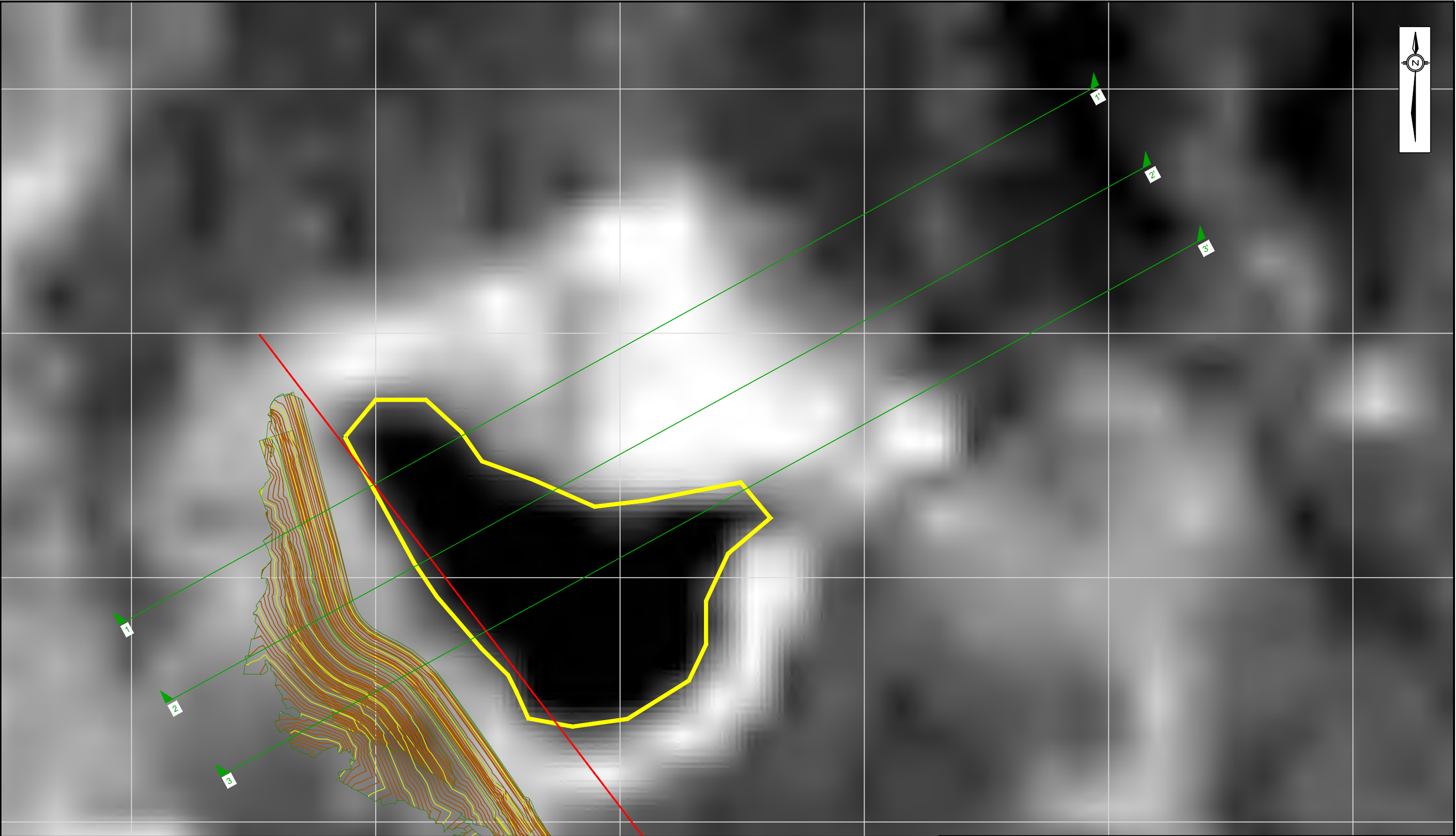
|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 6) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>MARCH 3, 1990 (S)<br>RAISE #6<br>DAM CREST EL. 891.5 m                                 |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-51                                                                                    |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

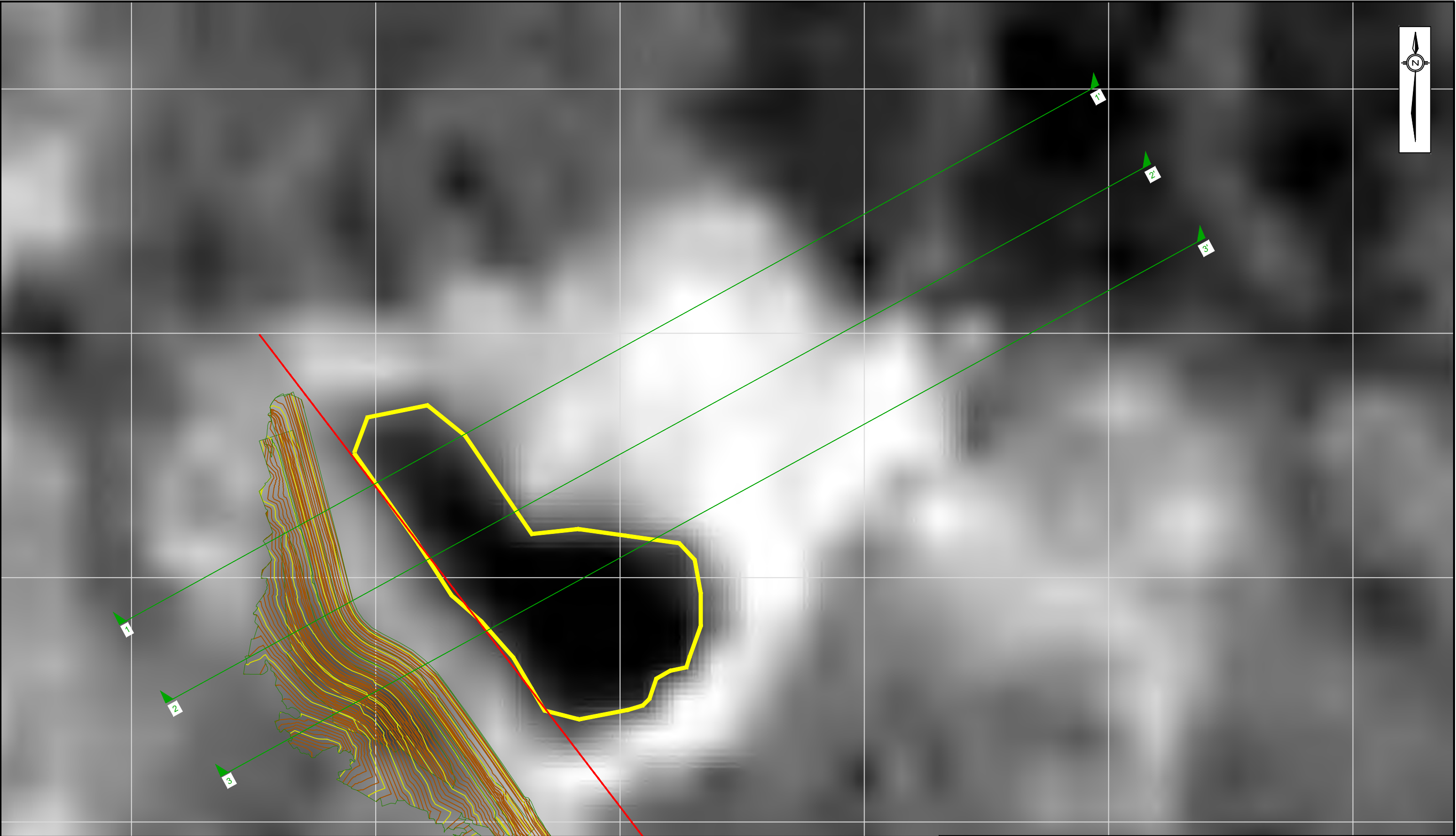
|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 6) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>APRIL 4, 1990 (S)<br>RAISE #6<br>DAM CREST EL. 891.5 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-52                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

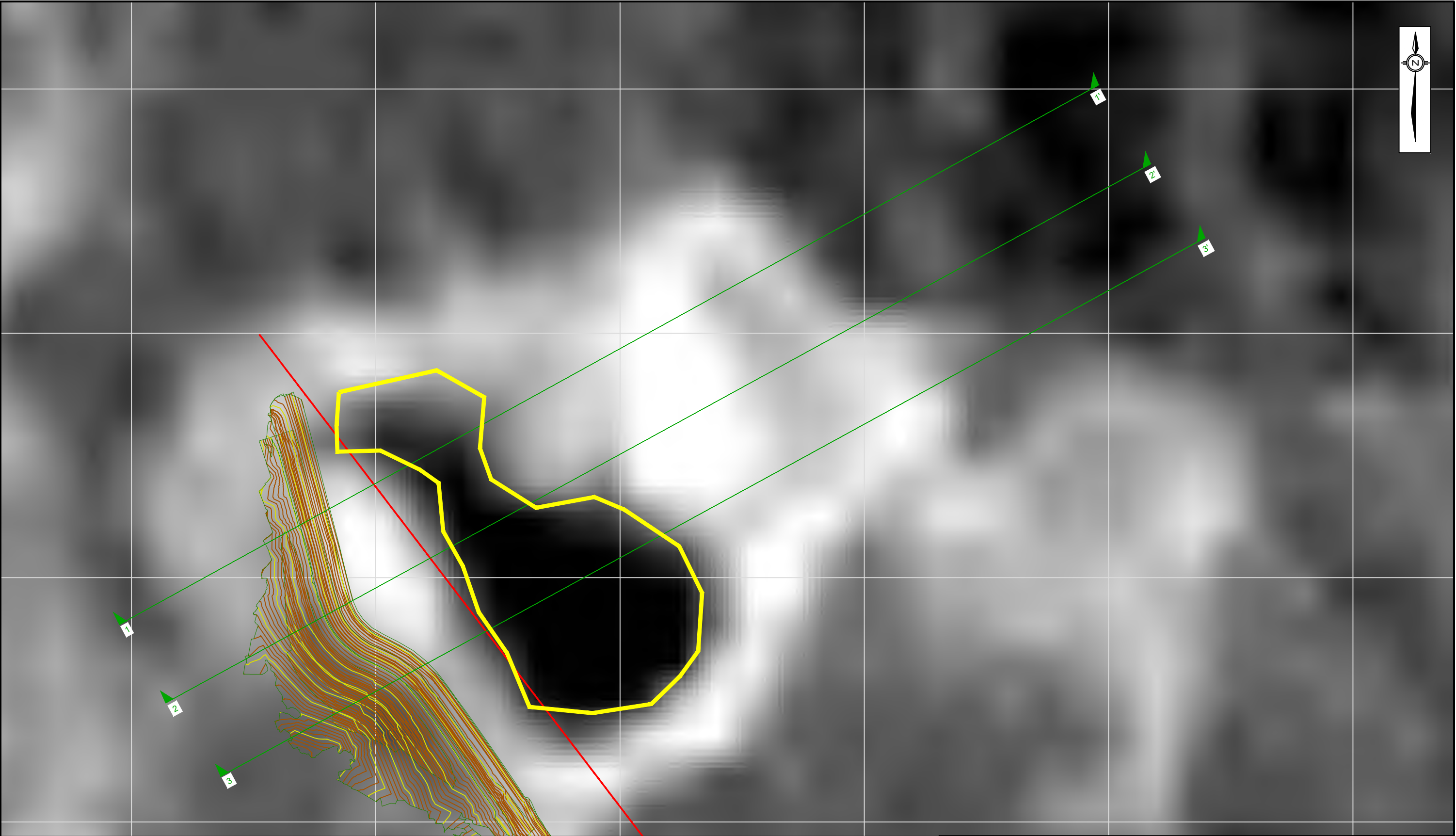
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 6) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JULY 9, 1990 (S)<br>RAISE #6<br>DAM CREST EL. 891.5 m                                  |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-53                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

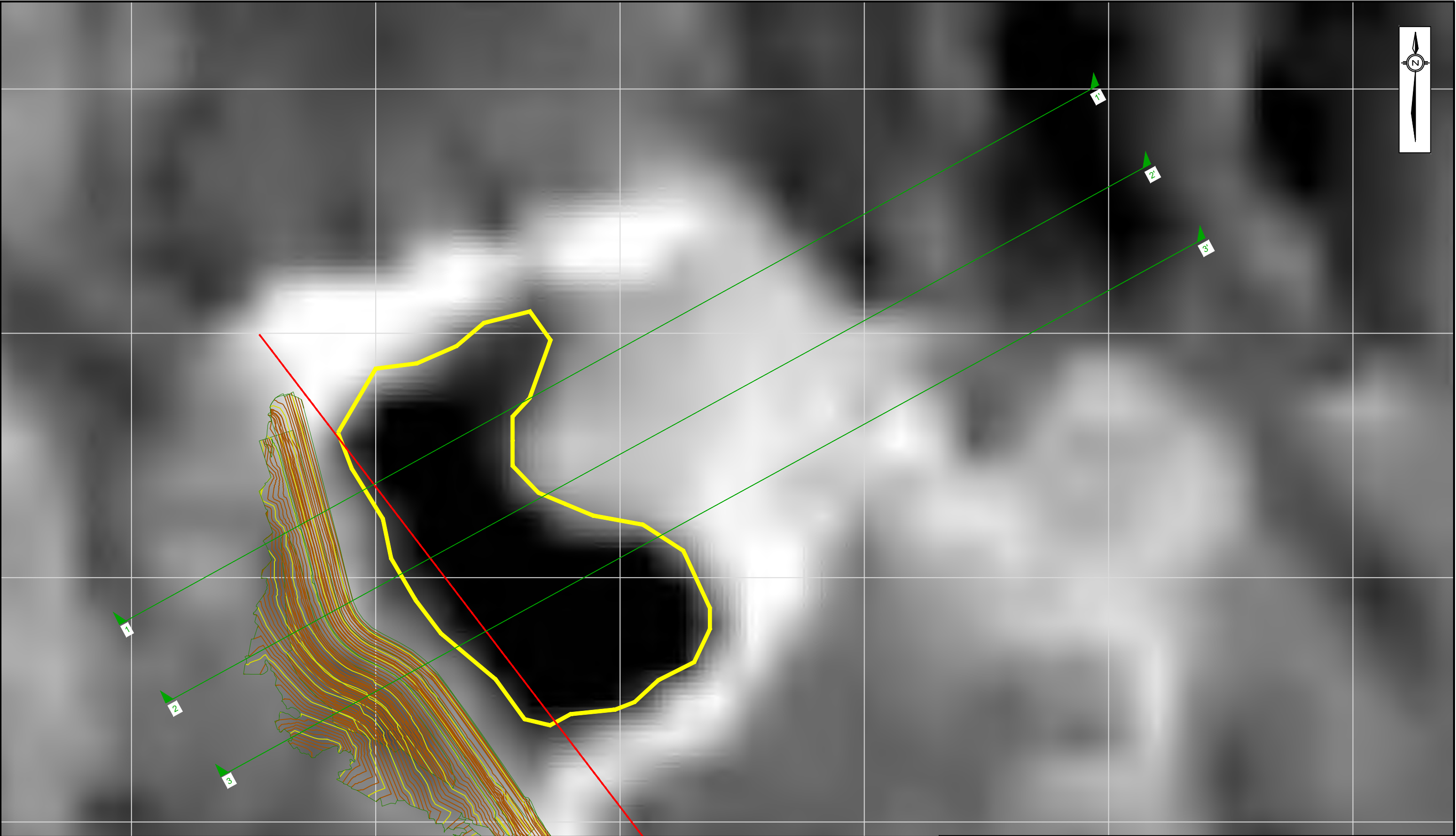
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 6) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JULY 25, 1990 (S)<br>RAISE #6<br>DAM CREST EL. 891.5 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-54                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

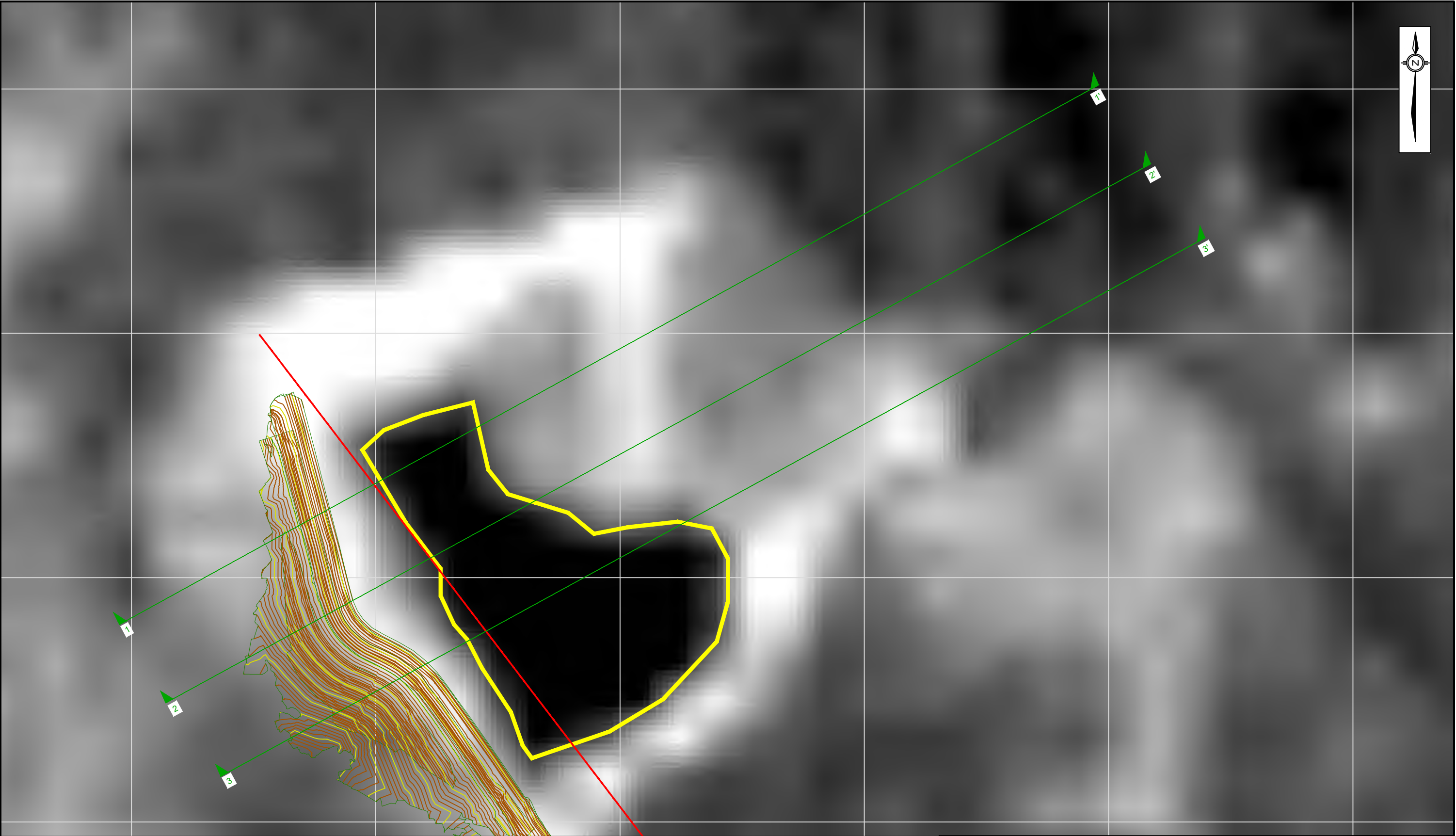
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 6) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 26, 1990 (S)<br>RAISE #6<br>DAM CREST EL. 891.5 m                               |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-55                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 6) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

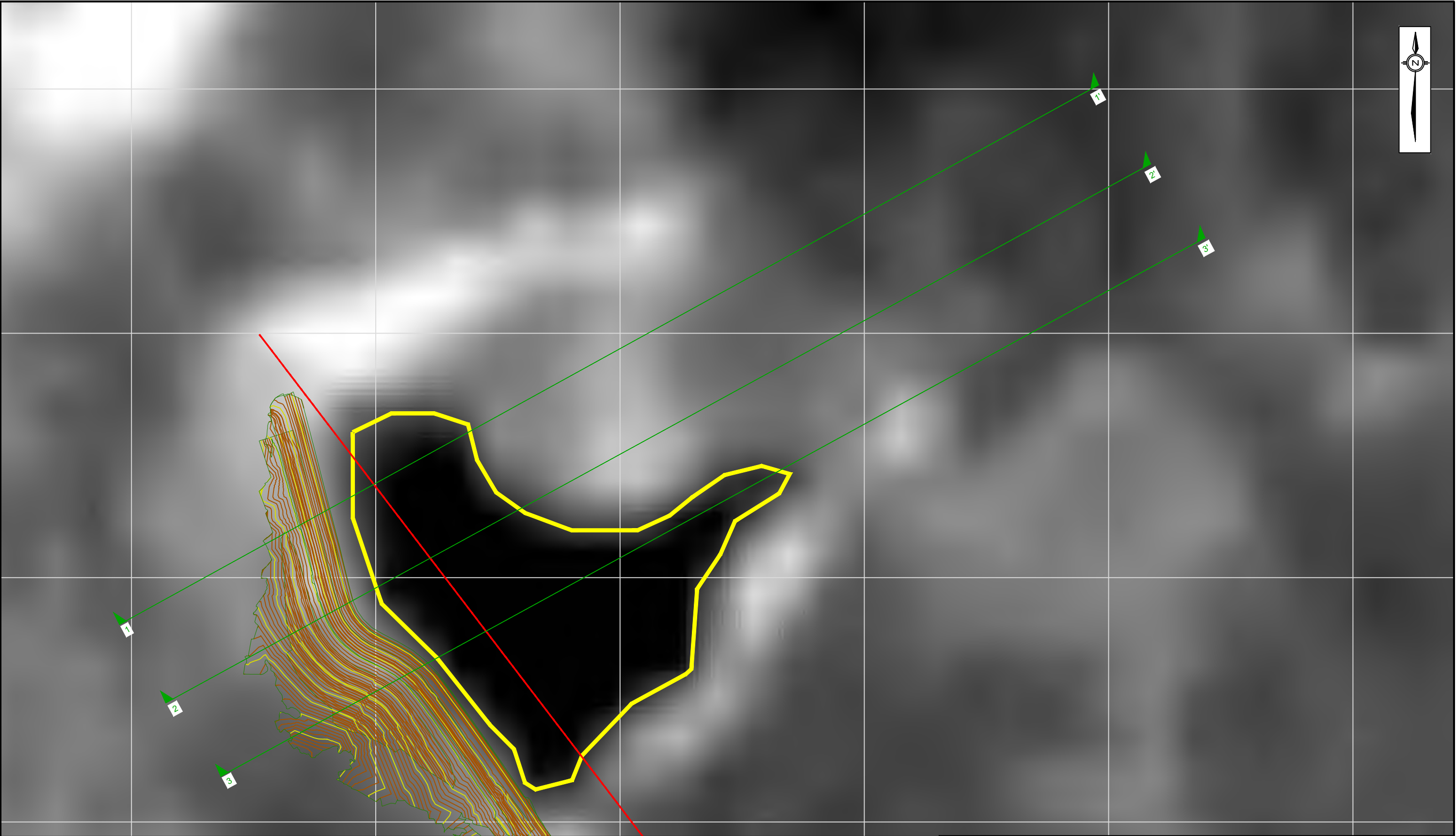
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
SEPTEMBER 11, 1990 (S)  
RAISE #6  
DAM CREST EL. 891.5 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-56 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

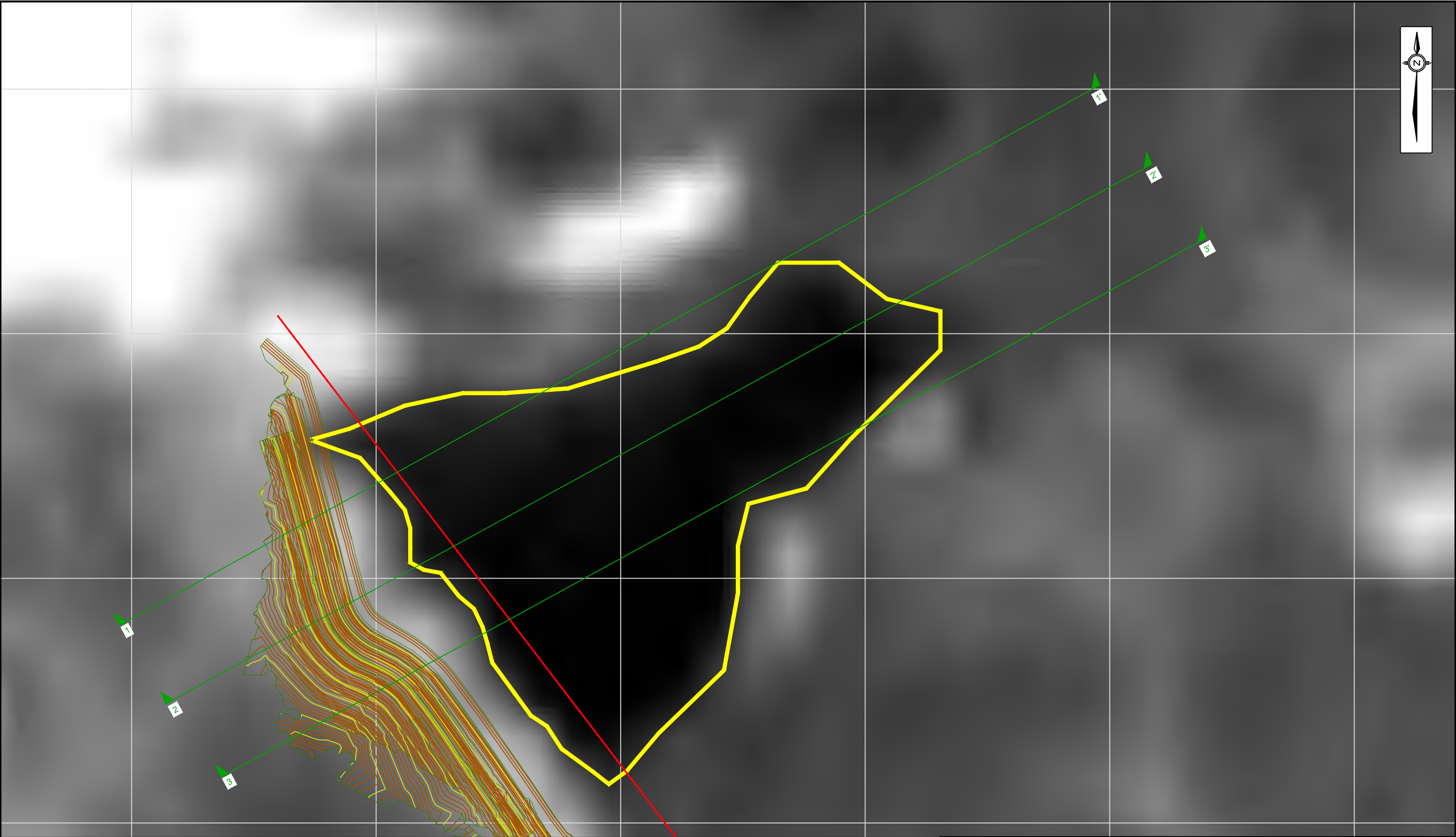
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 6) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>SEPTEMBER 27, 1990 (S)<br>RAISE #6<br>DAM CREST EL. 891.5 m                            |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-57                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

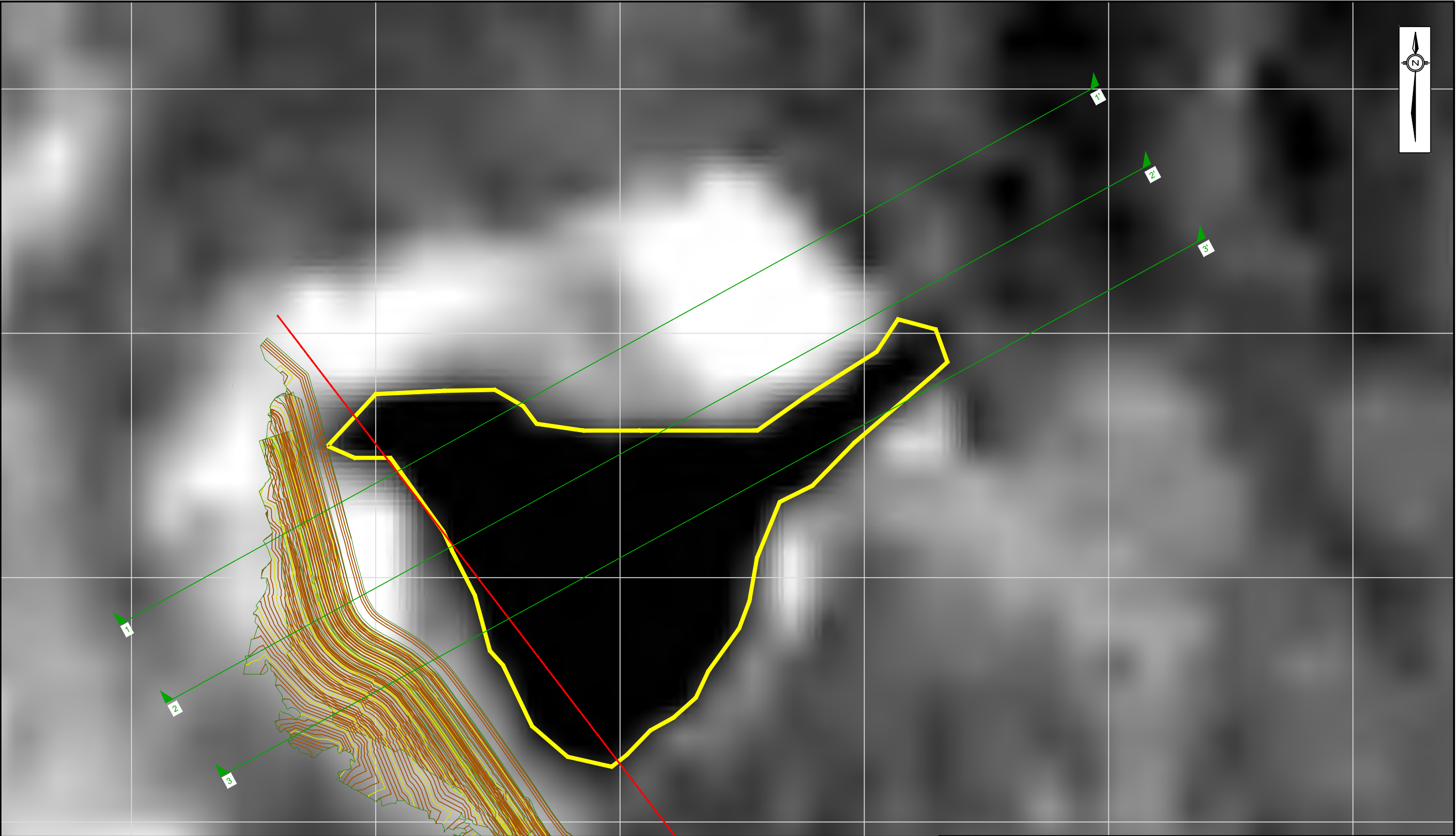
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 7) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JANUARY 1, 1991 (S)<br>RAISE #7<br>DAM CREST EL. 895 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-58                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
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- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

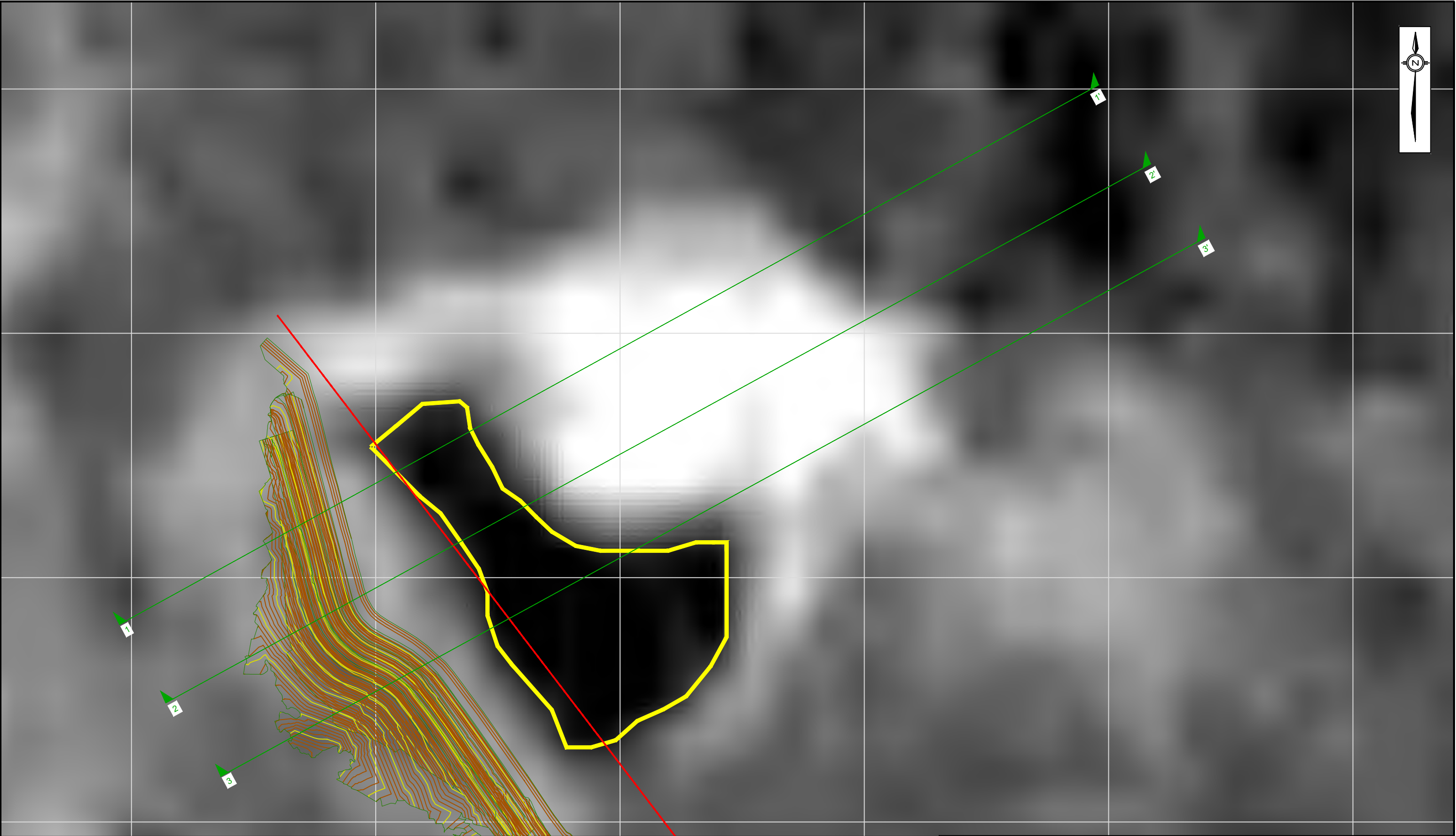
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 7) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>APRIL 7, 1991 (S)<br>RAISE #7<br>DAM CREST EL. 895 m                                   |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-59                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

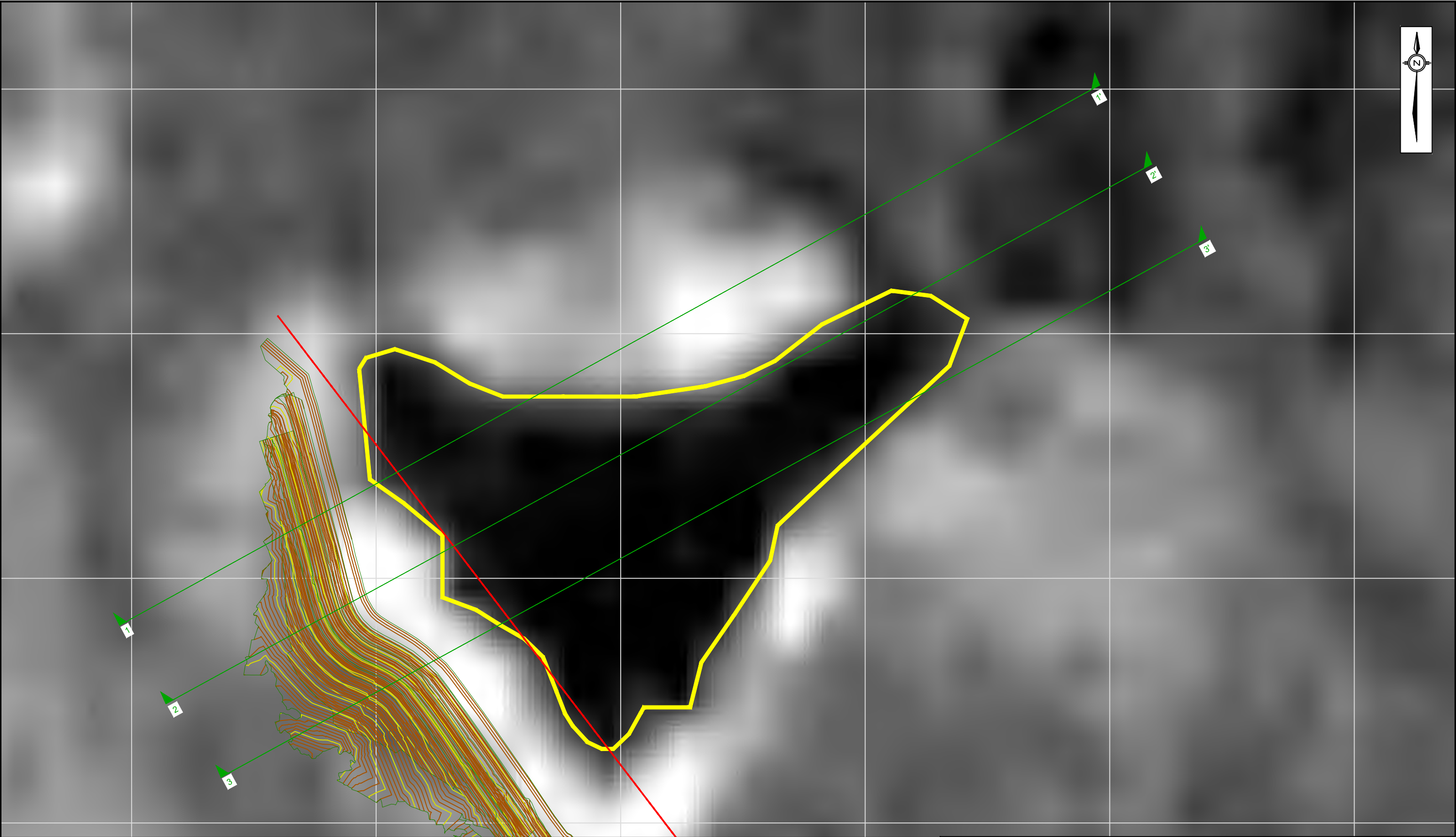
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 7) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------|
| CLIENT  | PROJECT                                                                                                    |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |
|         | TITLE                                                                                                      |
|         | SATELLITE IMAGES<br>JULY 12, 1991 (S)<br>RAISE #7<br>DAM CREST EL. 895 m                                   |
| SCALE   | PROJECT No.                                                                                                |
| 1:3,000 | A03355A02                                                                                                  |
|         | FIG. No.                                                                                                   |
|         | FIGURE I-60                                                                                                |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

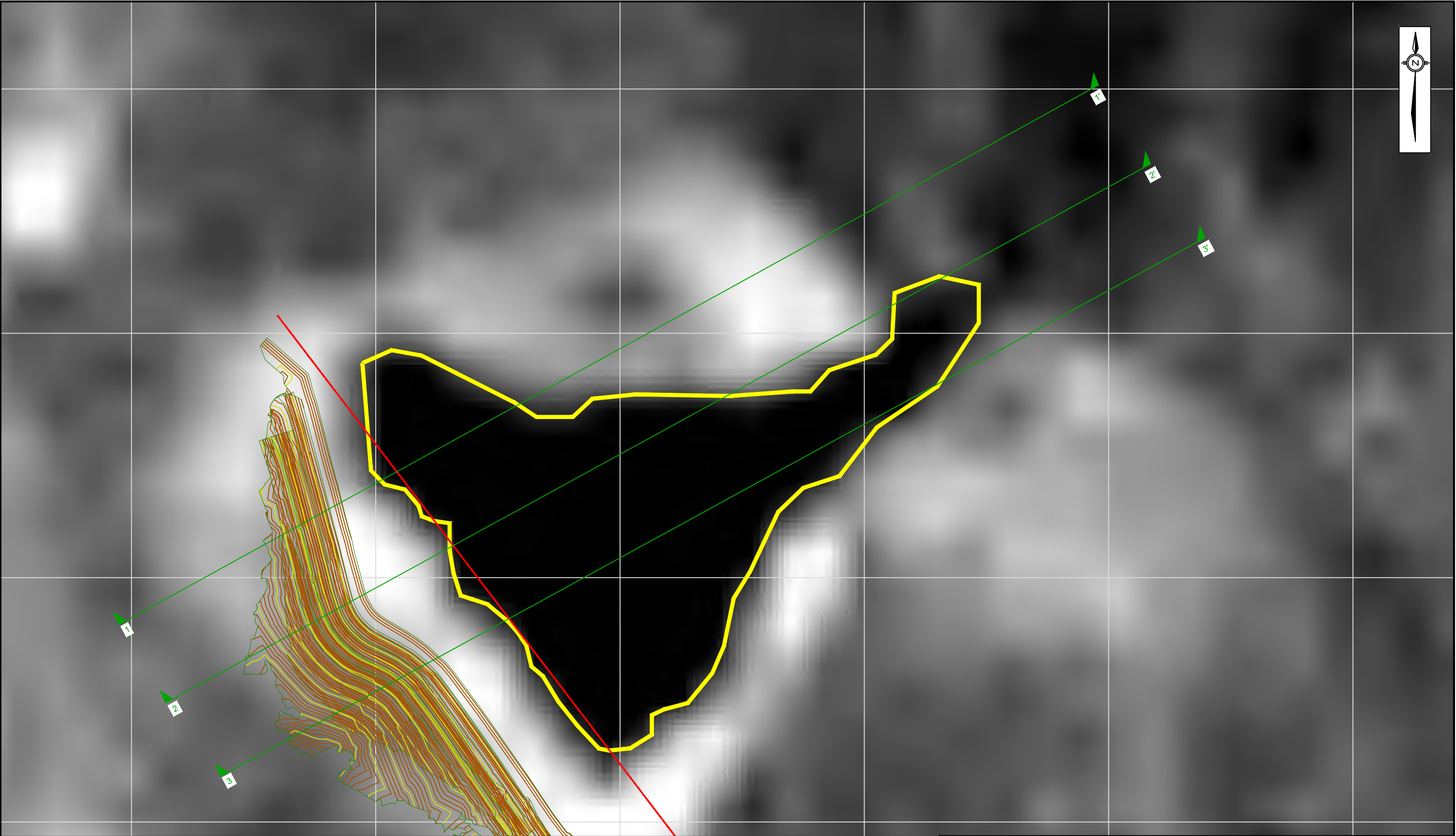
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 7) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------|
| CLIENT  | PROJECT                                                                                                    |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |
|         | TITLE                                                                                                      |
|         | SATELLITE IMAGES<br>JULY 30, 1992 (S)<br>RAISE #7<br>DAM CREST EL. 895 m                                   |
| SCALE   | PROJECT No.                                                                                                |
| 1:3,000 | A03355A02                                                                                                  |
|         | FIG. No.                                                                                                   |
|         | FIGURE I-61                                                                                                |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

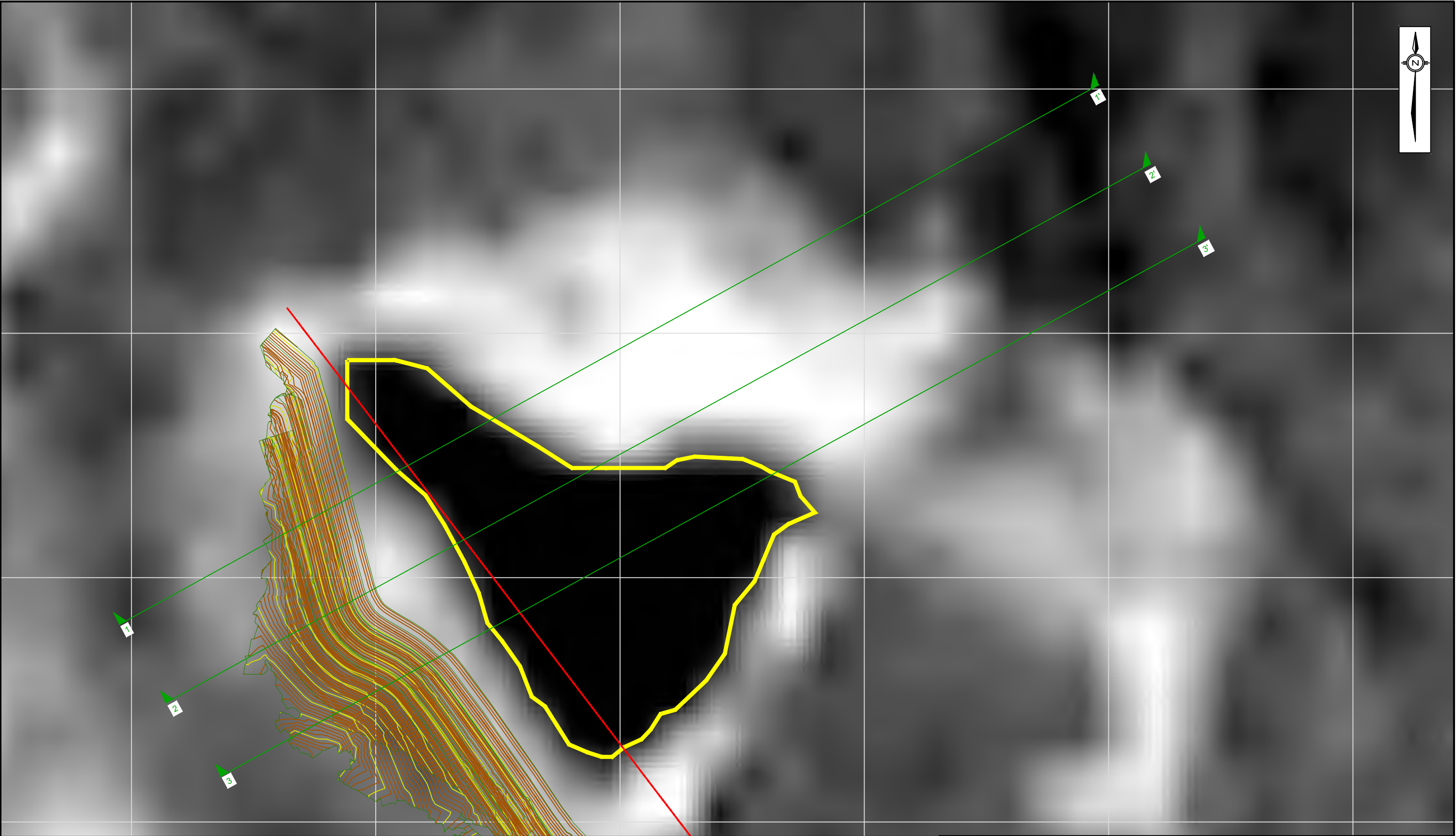
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 7) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 31, 1992 (S)<br>RAISE #7<br>DAM CREST EL. 895 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-62                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

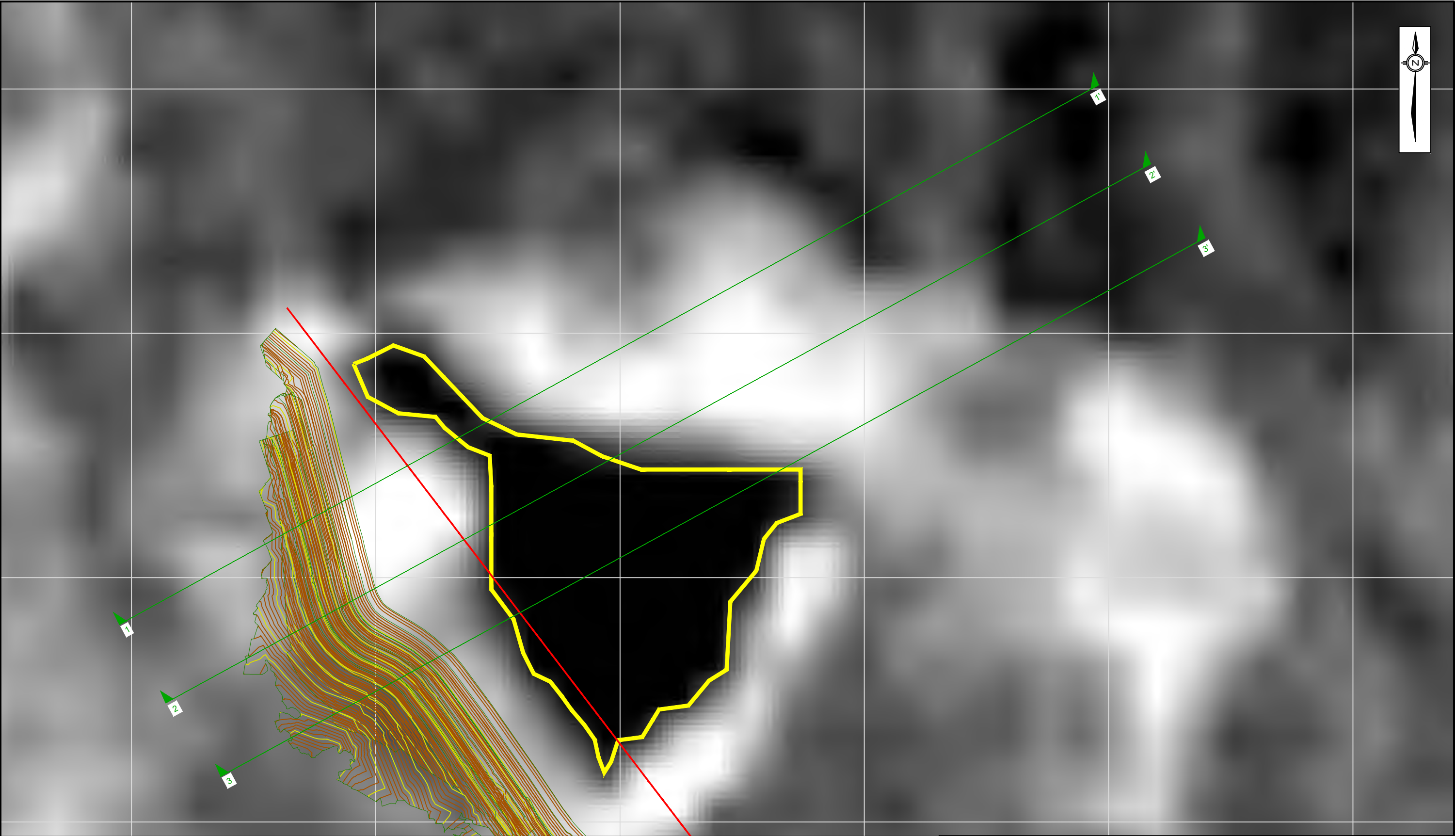
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                |                          |
|                                                                                                                       |                          |
|                                                                                                                       |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br>SATELLITE IMAGES<br>MARCH 27, 1993 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                                    |                          |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-63                                                                                               |                          |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

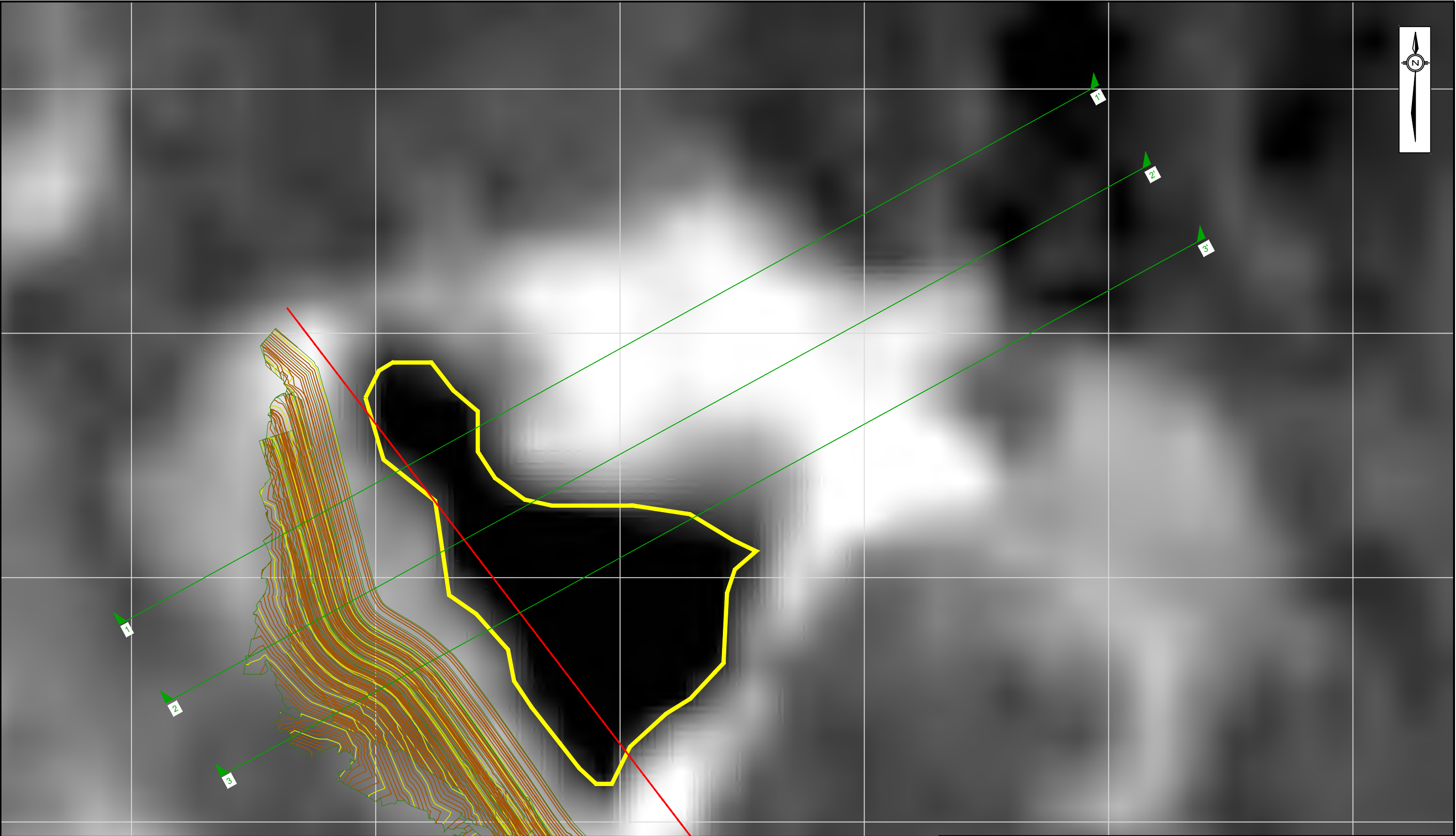
|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                          |                          |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                   |                          |
|                                                                                                                          |                          |
|                                                                                                                          |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF<br>THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br><b>SATELLITE IMAGES<br/>APRIL 28, 1993 (S)<br/>RAISE #8<br/>DAM CREST EL. 899 m</b>                             |                          |
| SCALE<br>1:3,000                                                                                                         | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-64                                                                                                  |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

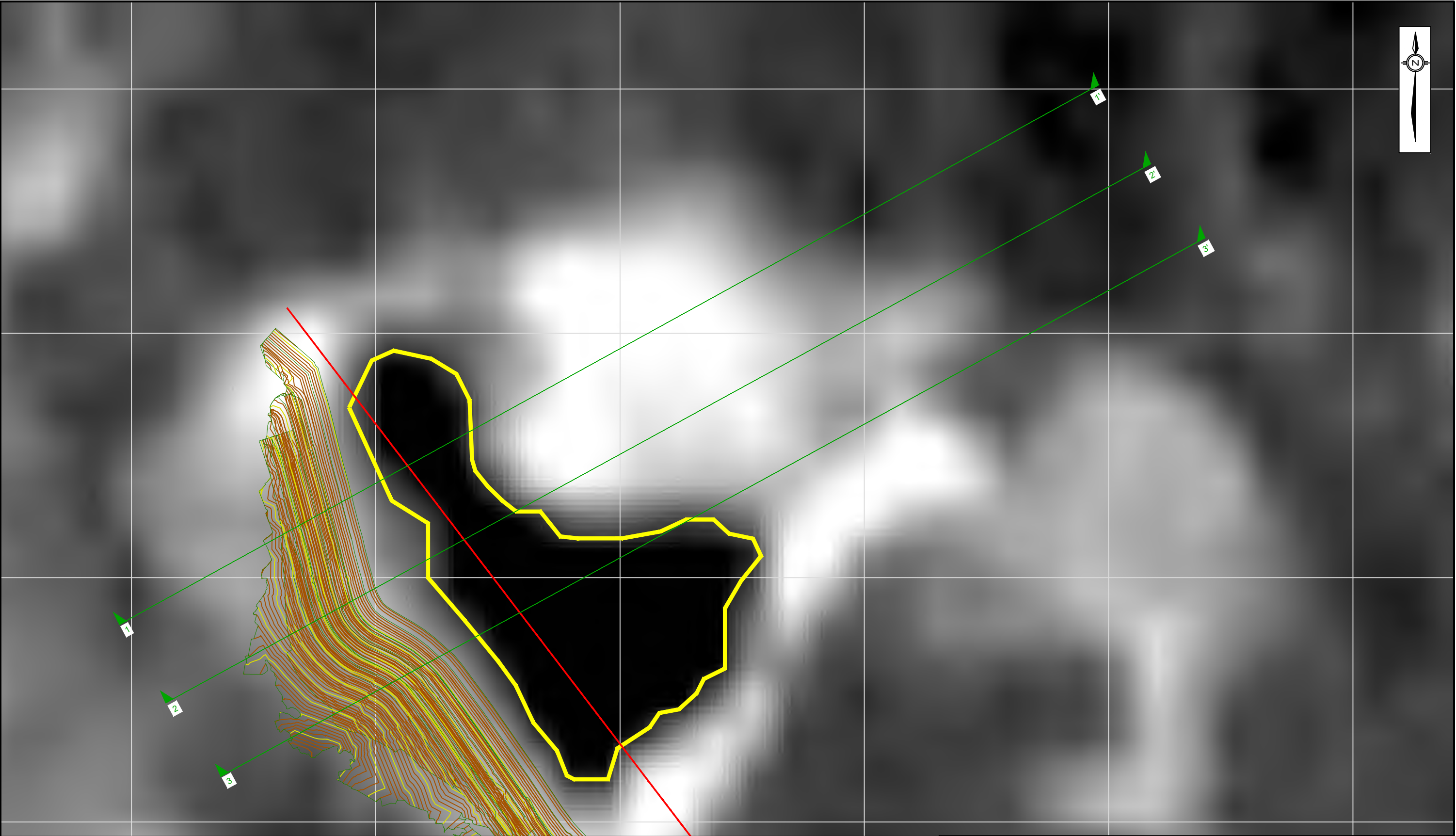
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 18, 1993 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                                 |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-65                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

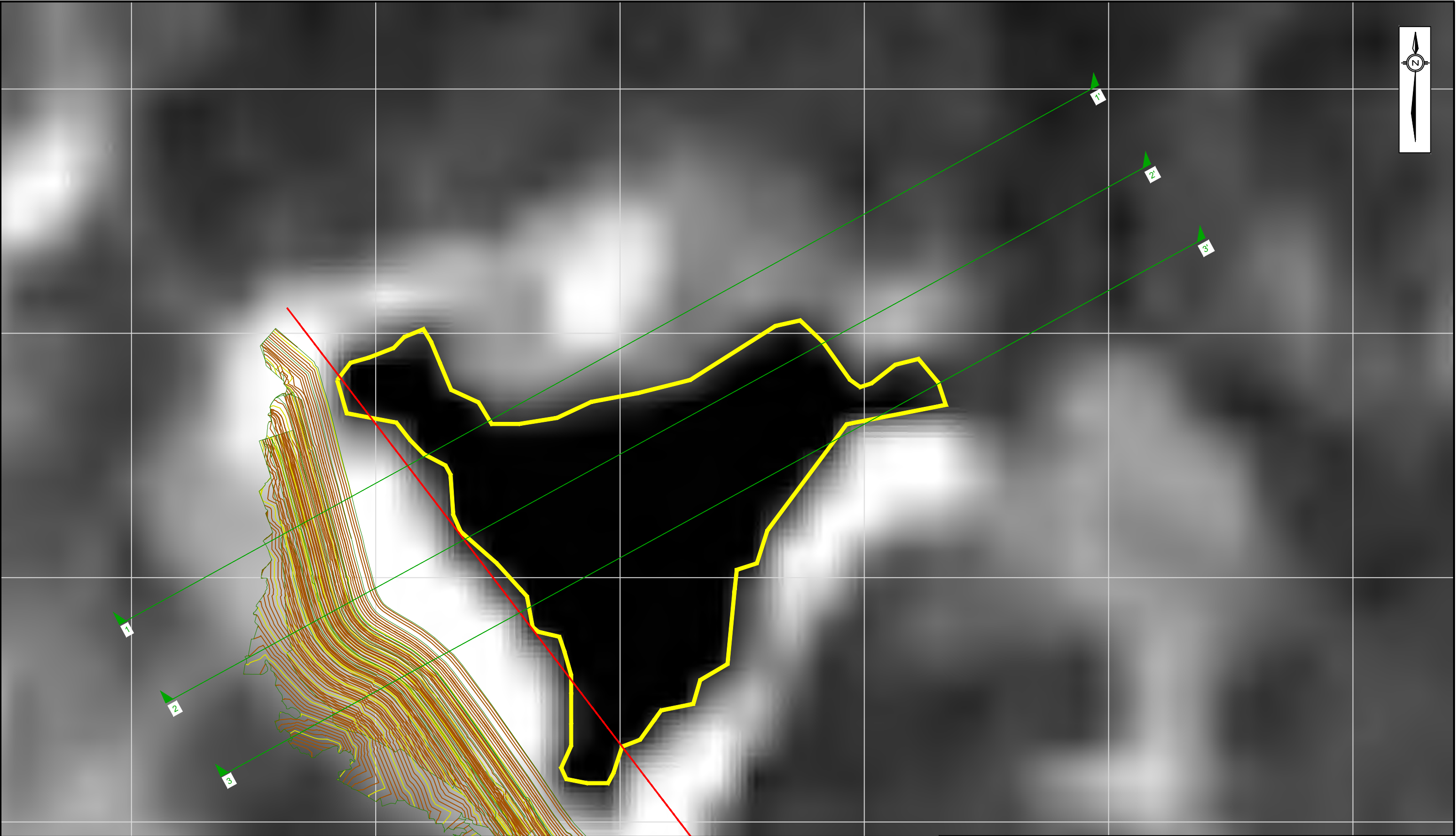
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>SEPTEMBER 19, 1993 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                              |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-66                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

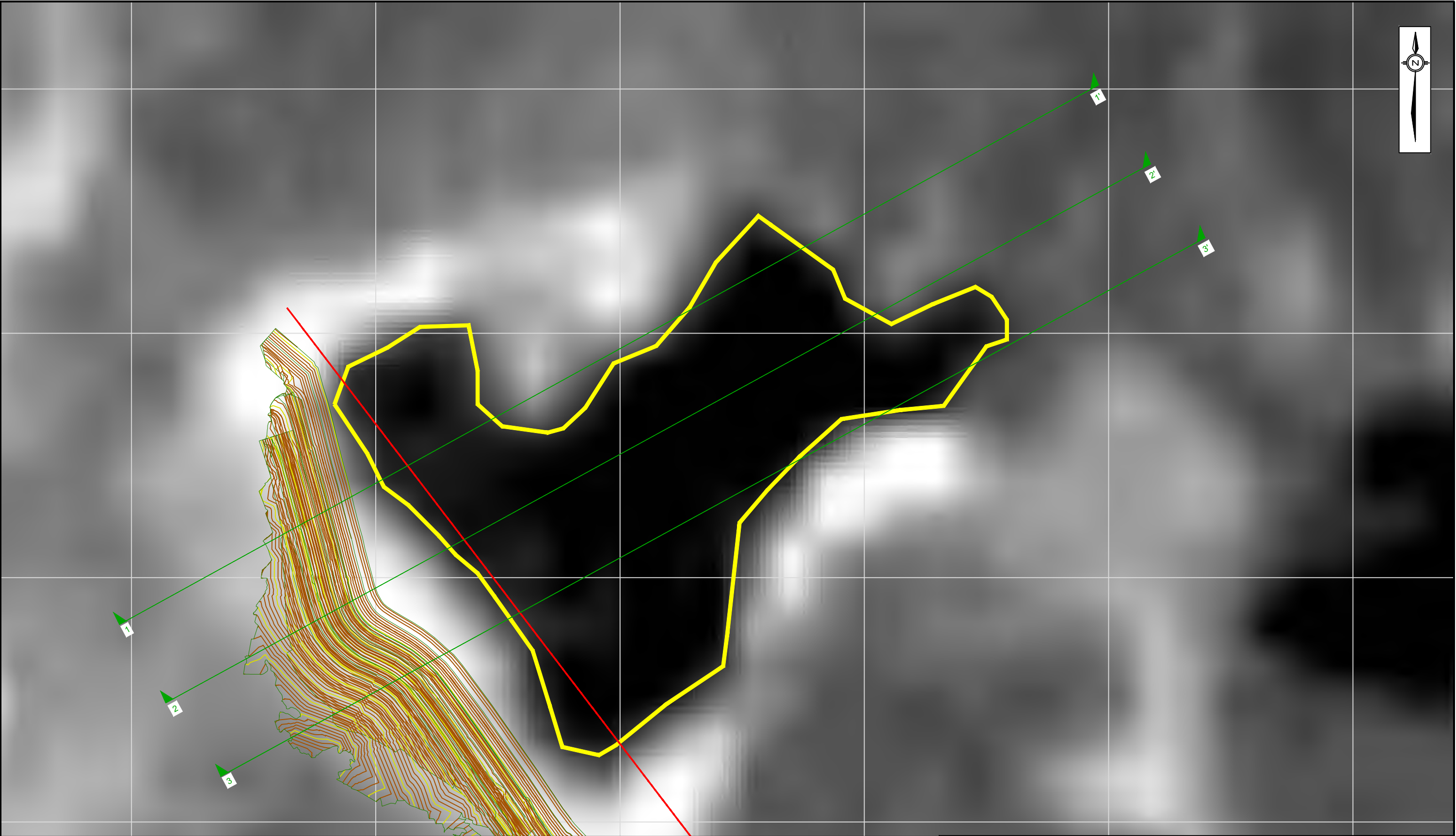
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>NOVEMBER 6, 1993 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                                |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-67                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

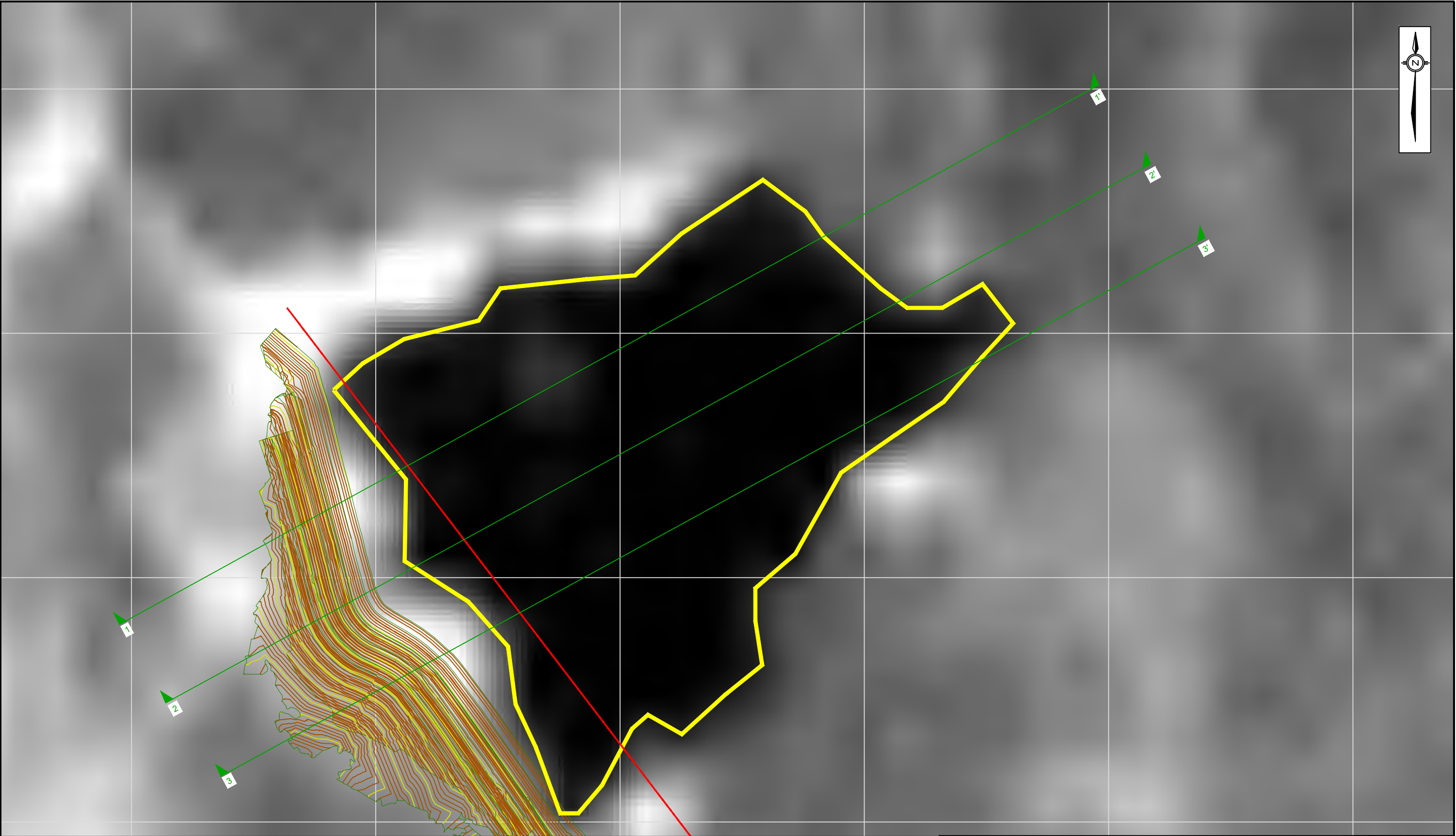
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>DECEMBER 8, 1993 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                                |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-68                                                                                    |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

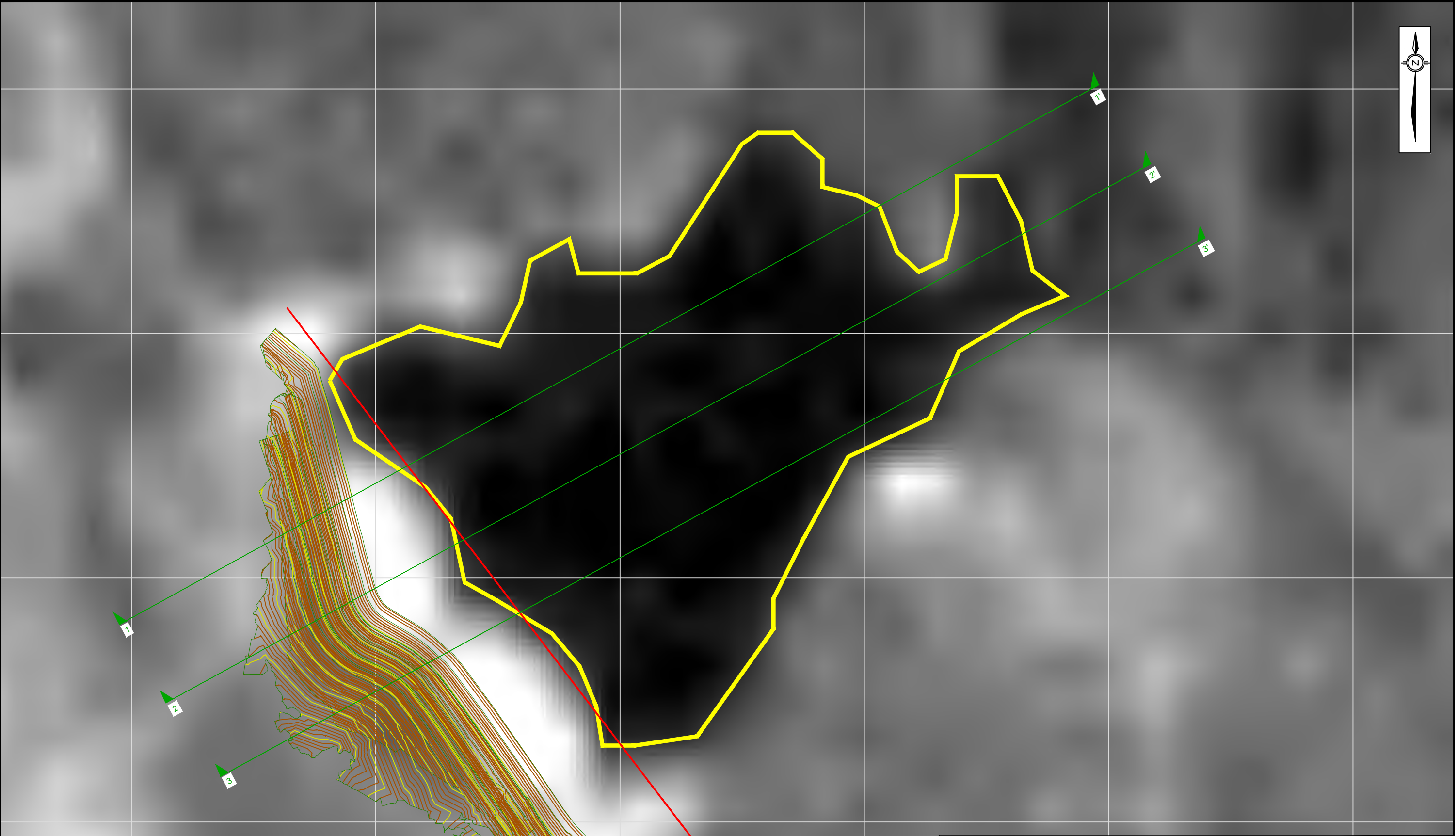
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>FEBRUARY 10, 1994 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                               |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-69                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

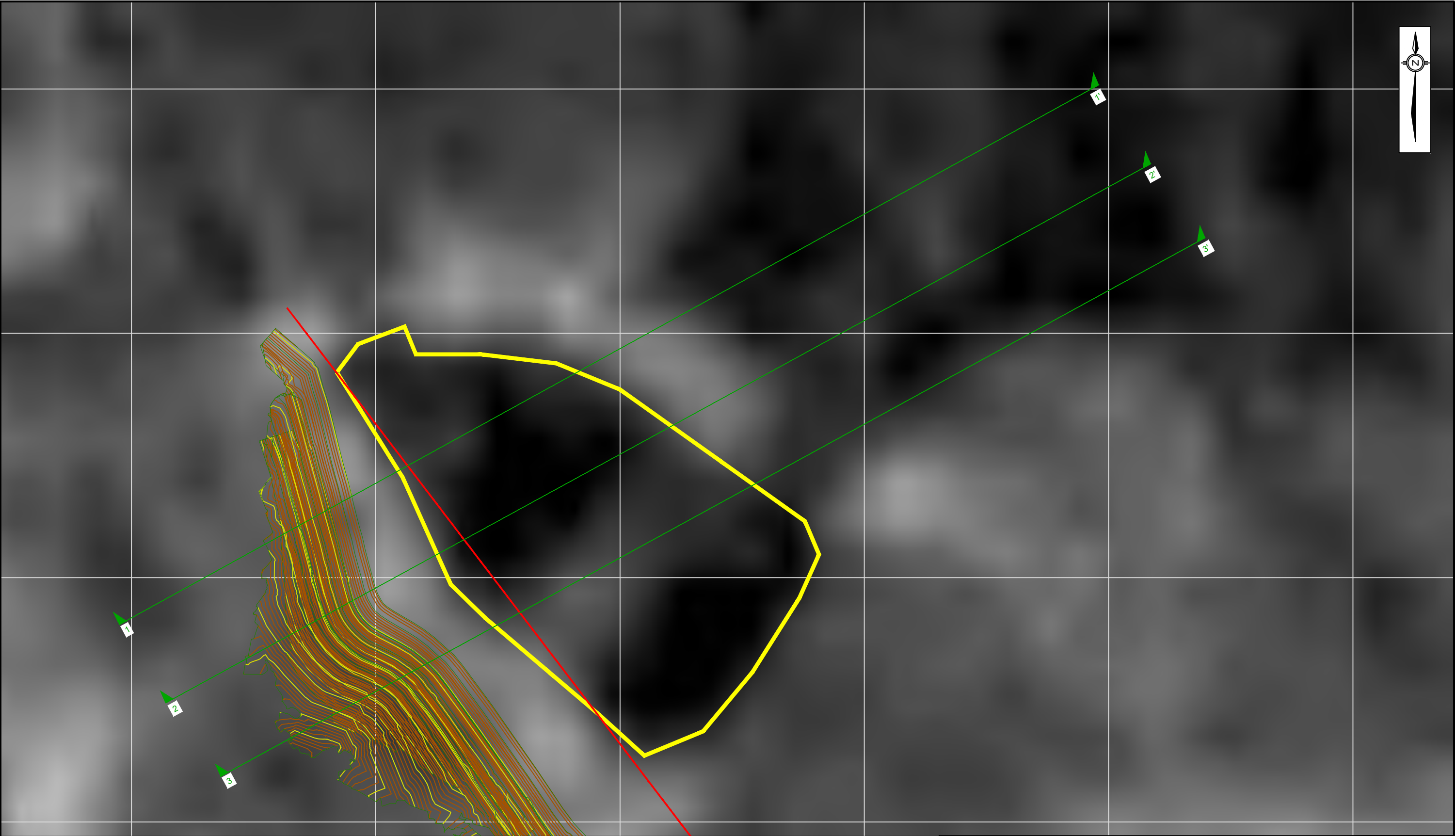
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
MAY 1, 1994 (S)  
RAISE #8  
DAM CREST EL. 899 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-70 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

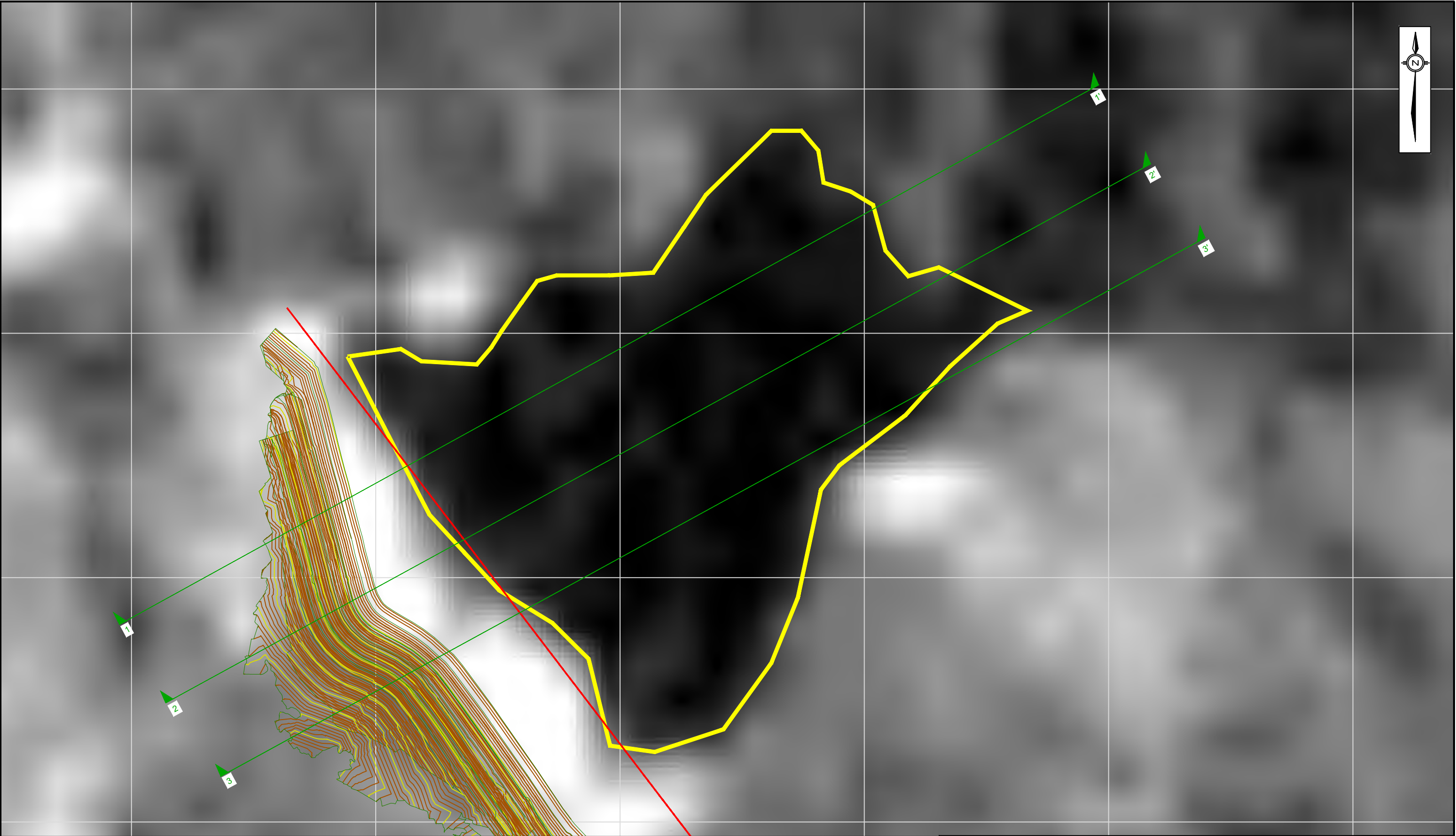
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JUNE 2, 1994 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                                    |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-71                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
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- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

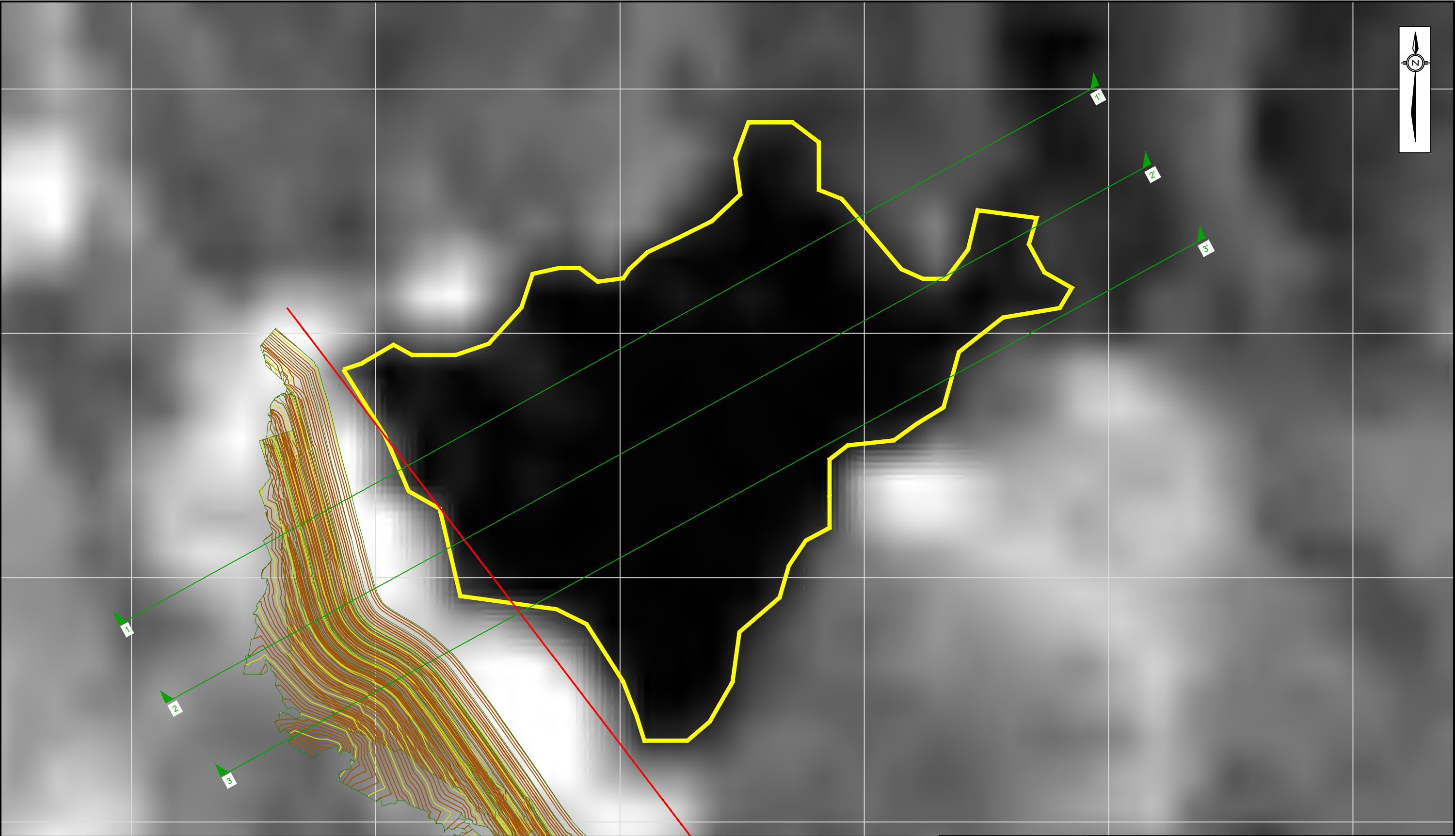
**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |                                                                                                            |
|---------|------------------------------------------------------------------------------------------------------------|
| CLIENT  | PROJECT                                                                                                    |
|         | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |
|         | TITLE                                                                                                      |
|         | SATELLITE IMAGES<br>JUNE 18, 1994 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                                   |
| SCALE   | PROJECT No.                                                                                                |
| 1:3,000 | A03355A02                                                                                                  |
|         | FIG. No.                                                                                                   |
|         | FIGURE I-72                                                                                                |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

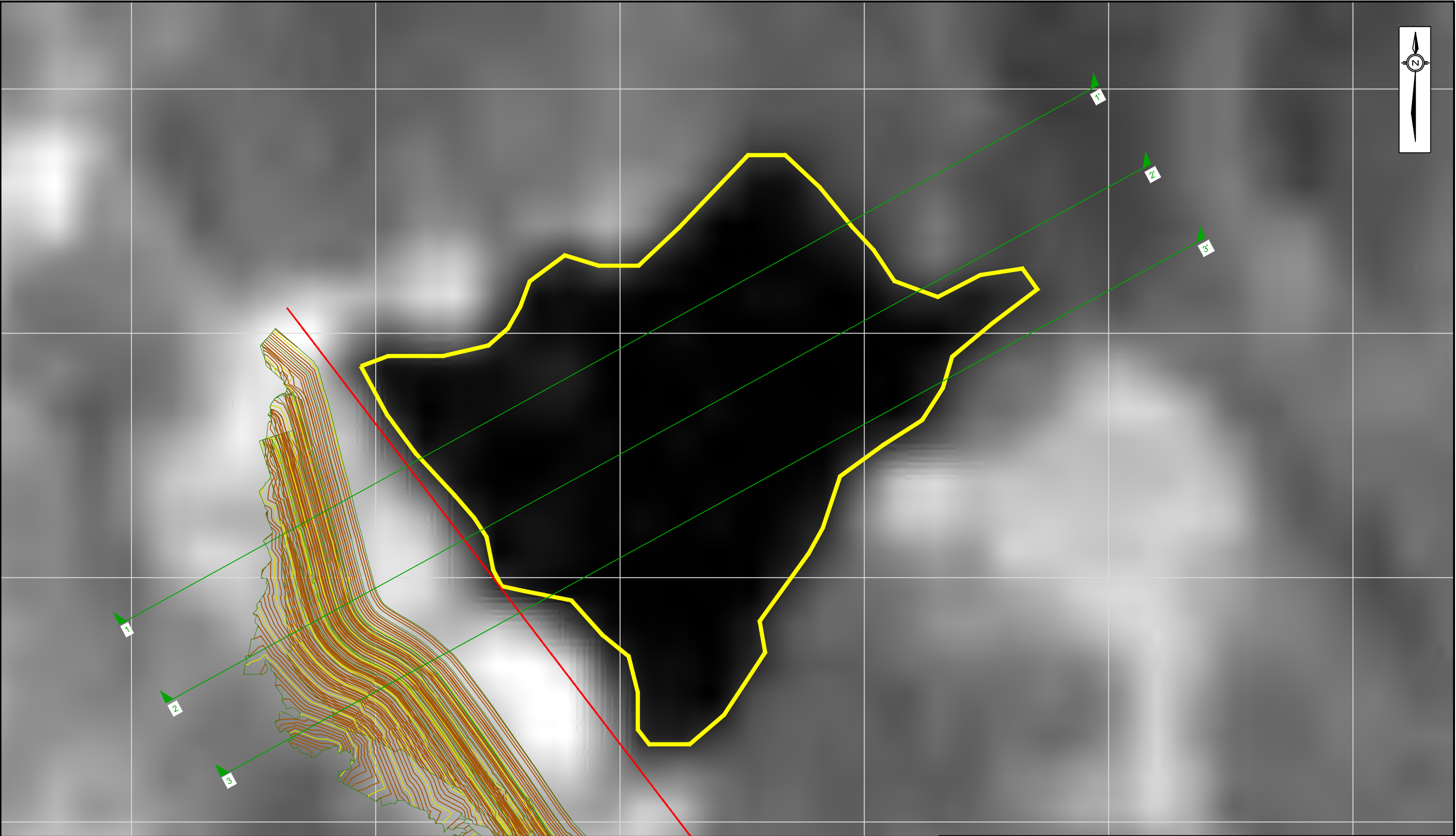
|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                          |                          |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                   |                          |
|                                                                                                                          |                          |
|                                                                                                                          |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF<br>THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br>SATELLITE IMAGES<br>AUGUST 5, 1994 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                                       |                          |
| SCALE<br>1:3,000                                                                                                         | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-73                                                                                                  |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

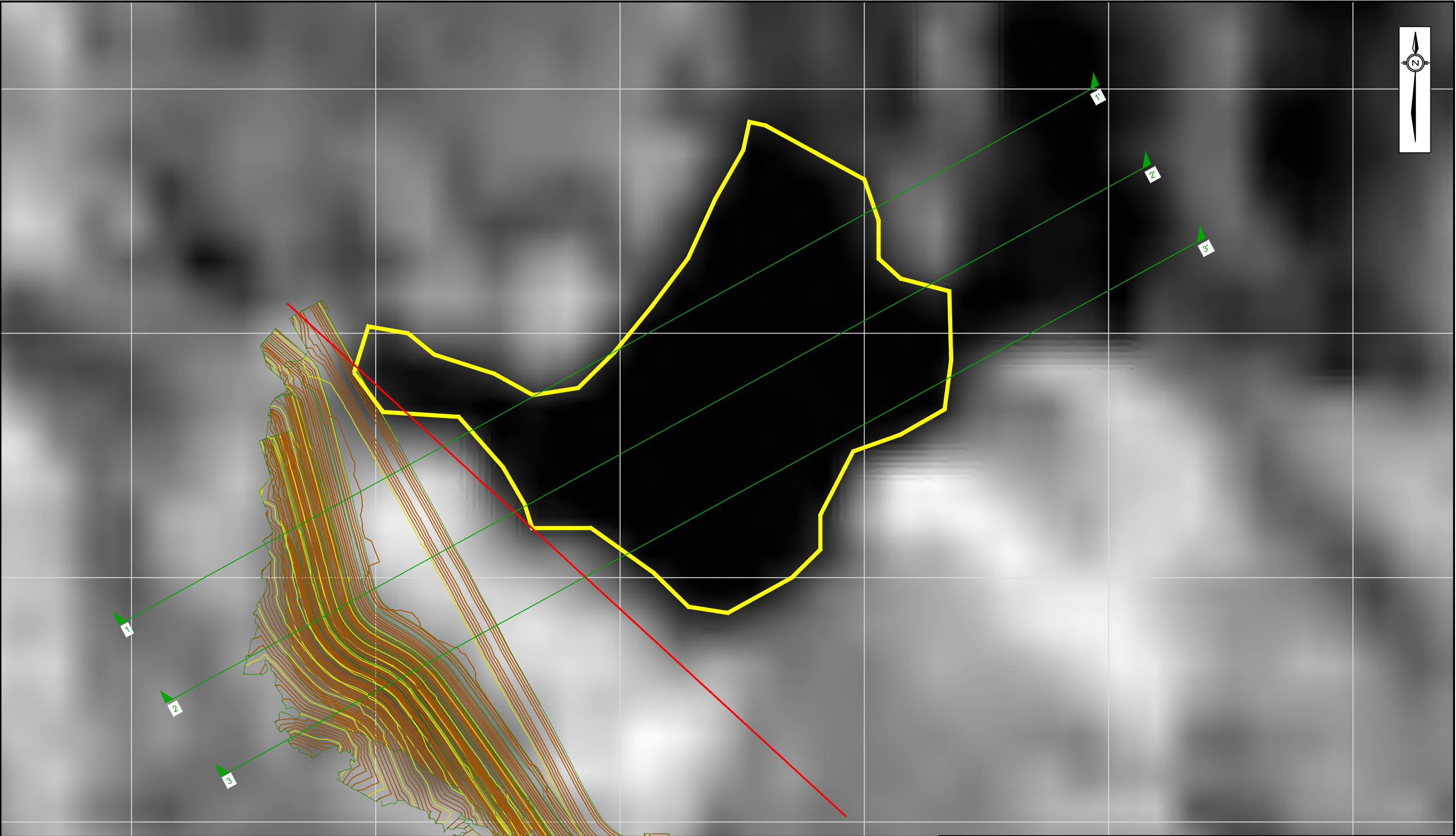
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 8) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>SEPTEMBER 22, 1994 (S)<br>RAISE #8<br>DAM CREST EL. 899 m                              |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-74                                                                                    |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

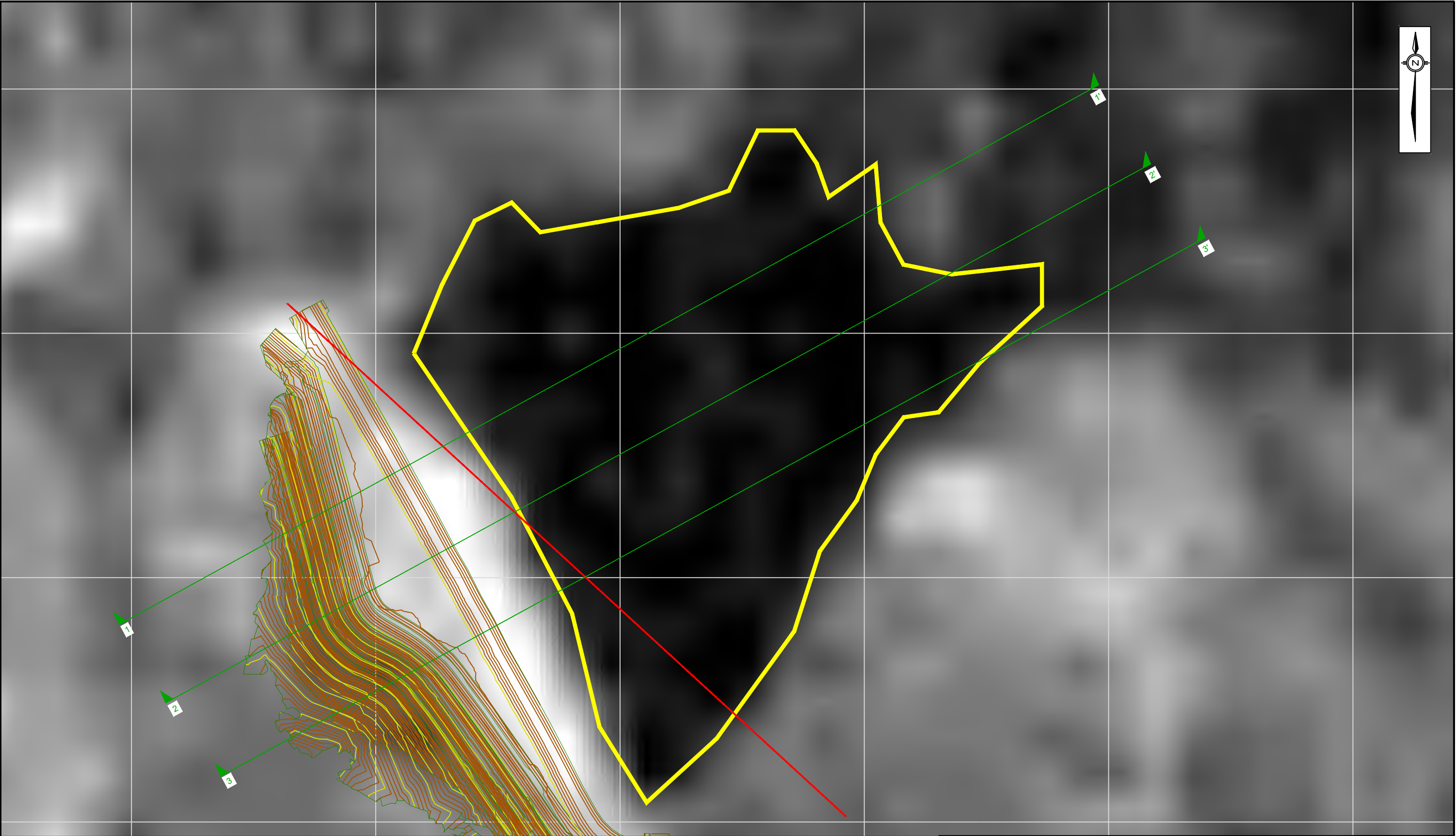
**LEGEND:**

|                                                |                   |
|------------------------------------------------|-------------------|
| DESIGN SECTIONS                                | 1 m CONTOURS      |
| POND OUTLINE                                   | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 9) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JULY 7, 1995 (S)<br>RAISE #9<br>DAM CREST EL. 905 m                                    |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-75                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

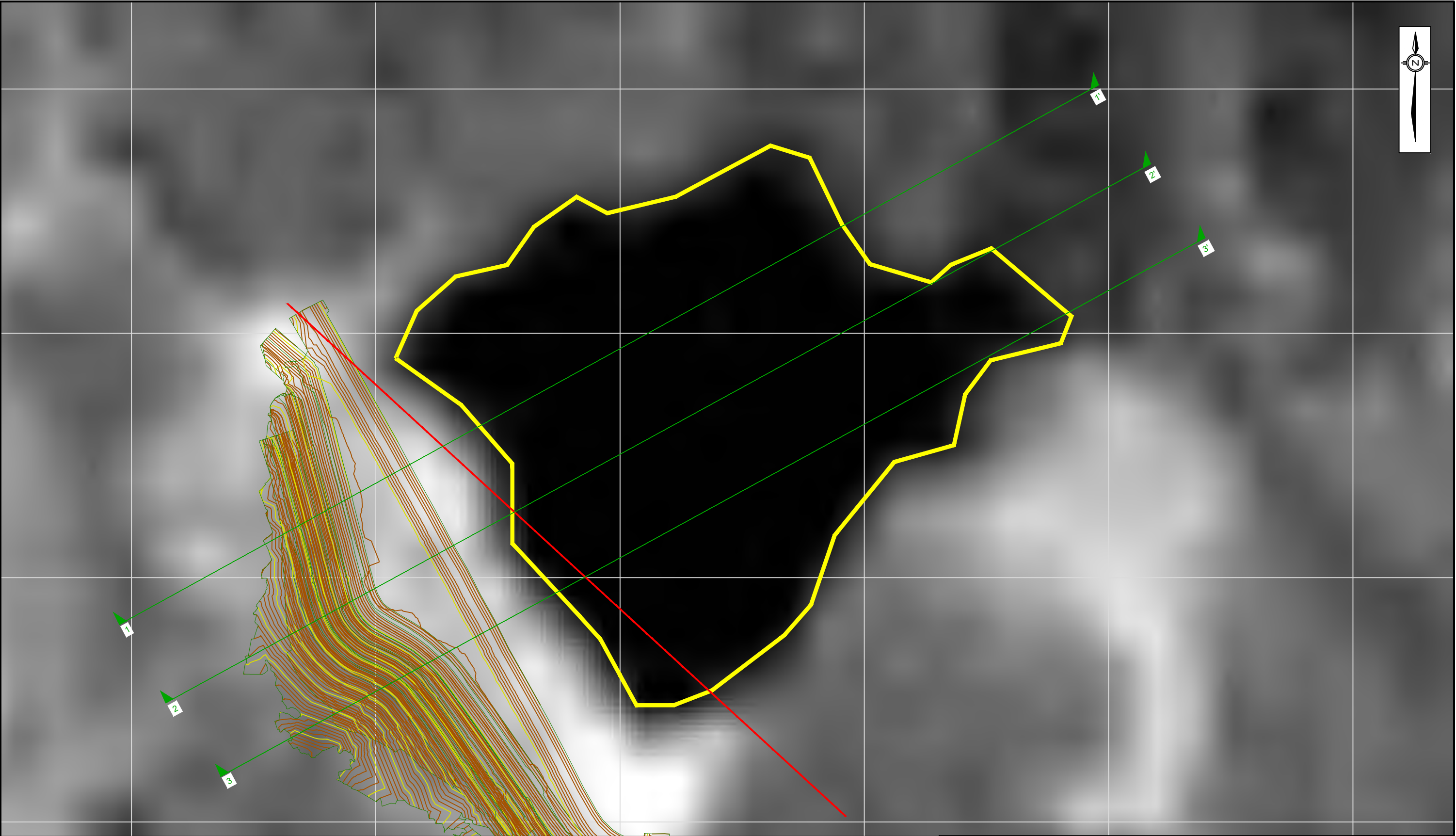
|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 9) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|         |             |                                                                                                            |
|---------|-------------|------------------------------------------------------------------------------------------------------------|
| CLIENT  |             | PROJECT                                                                                                    |
|         |             | REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |
|         |             | TITLE                                                                                                      |
|         |             | SATELLITE IMAGES<br>JUNE 7, 1996 (S)<br>RAISE #9<br>DAM CREST EL. 905 m                                    |
| SCALE   | PROJECT No. | FIG. No.                                                                                                   |
| 1:3,000 | A03355A02   | FIGURE I-76                                                                                                |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 9) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

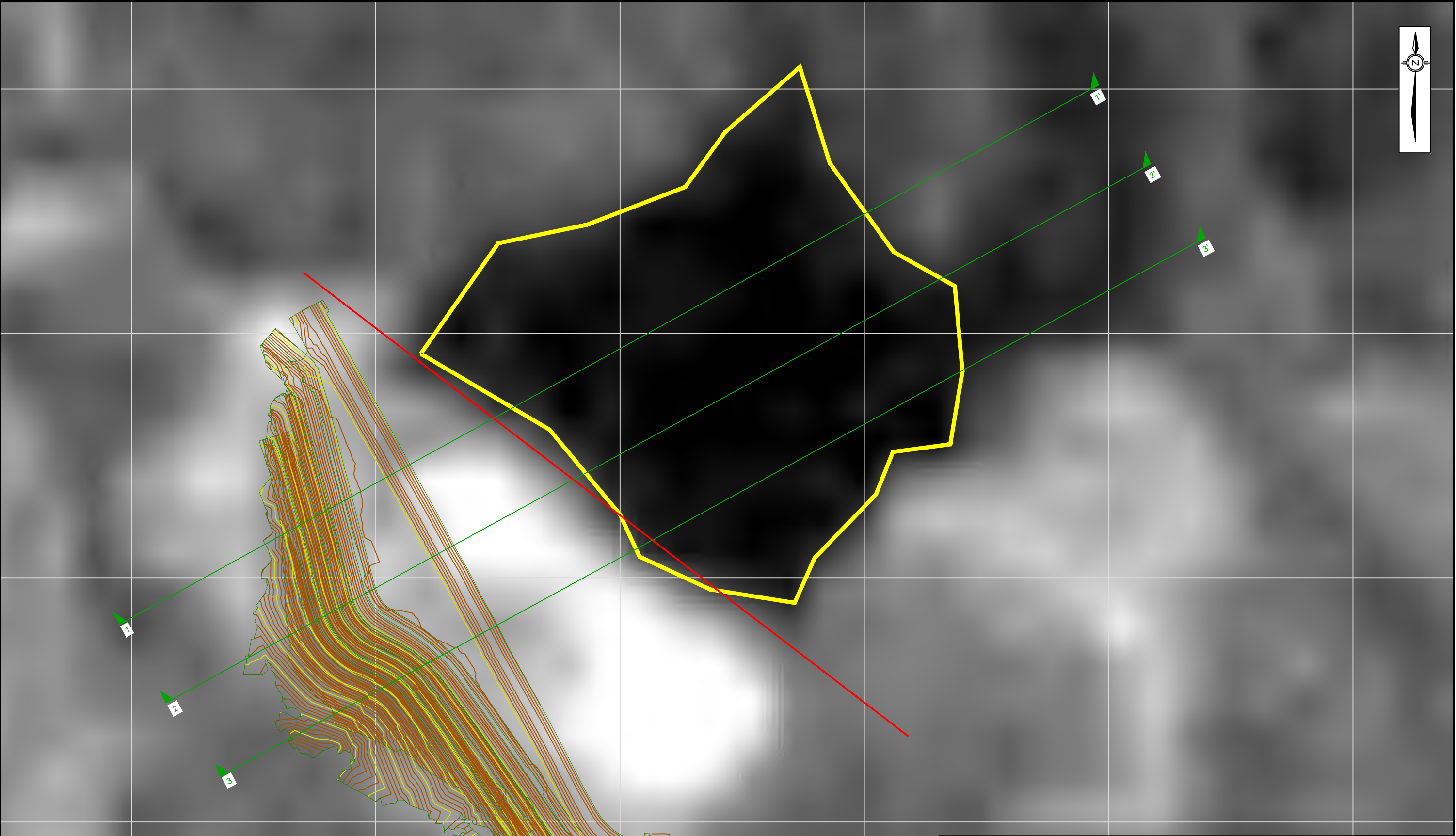
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
AUGUST 26, 1996 (S)  
RAISE #9  
DAM CREST EL. 905 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-77 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 9) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
|                                                                                                            |                          |
|                                                                                                            |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>JULY 28, 1997 (S)<br>RAISE #9<br>DAM CREST EL. 905 m                                   |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-78                                                                                    |                          |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 9) | DAM RAISE OUTLINE |

1:3,000

0 30 60

BASED ON A 11"X 17" DRAWING SIZE

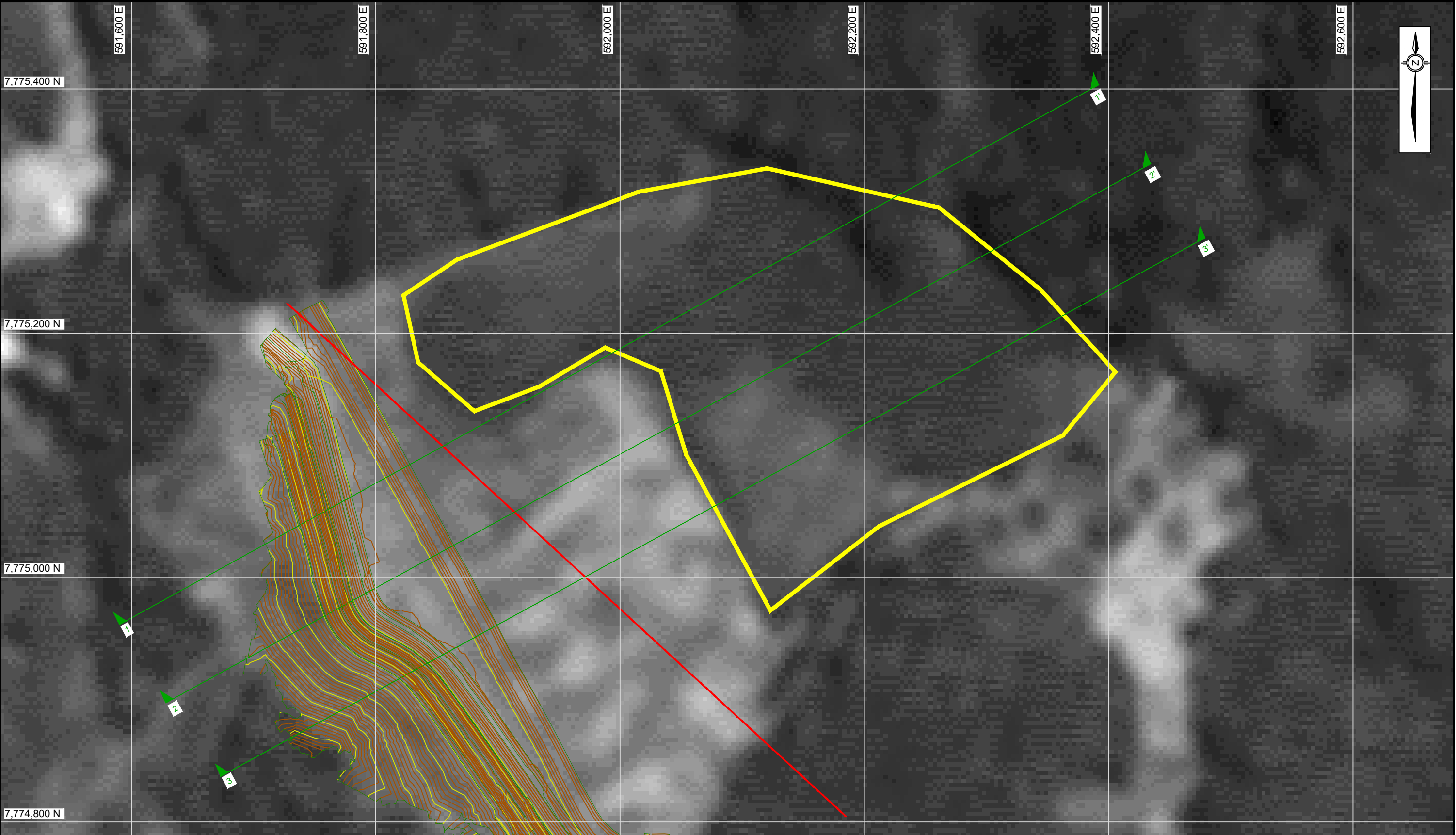
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
FEBRUARY 1998  
RAISE #9  
DAM CREST EL. 905 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-79 |
|------------------|--------------------------|-------------------------|

ROB-FIG-1



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                             |                   |
|---------------------------------------------|-------------------|
| DESIGN SECTIONS                             | 1 m CONTOURS      |
| POND OUTLINE                                | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 9) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

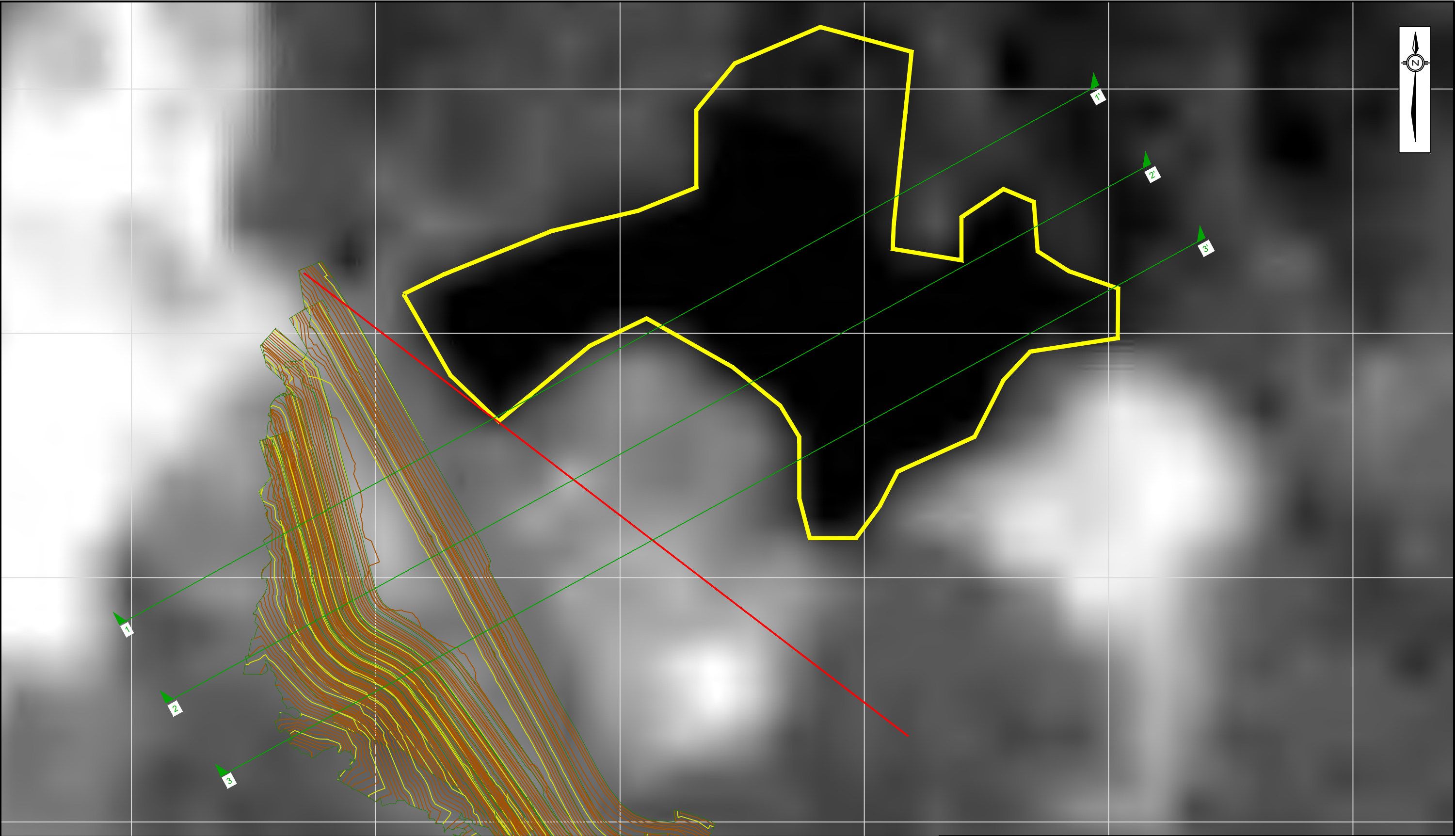
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
MARCH 1998  
RAISE #9  
DAM CREST EL. 905.0 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-80 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

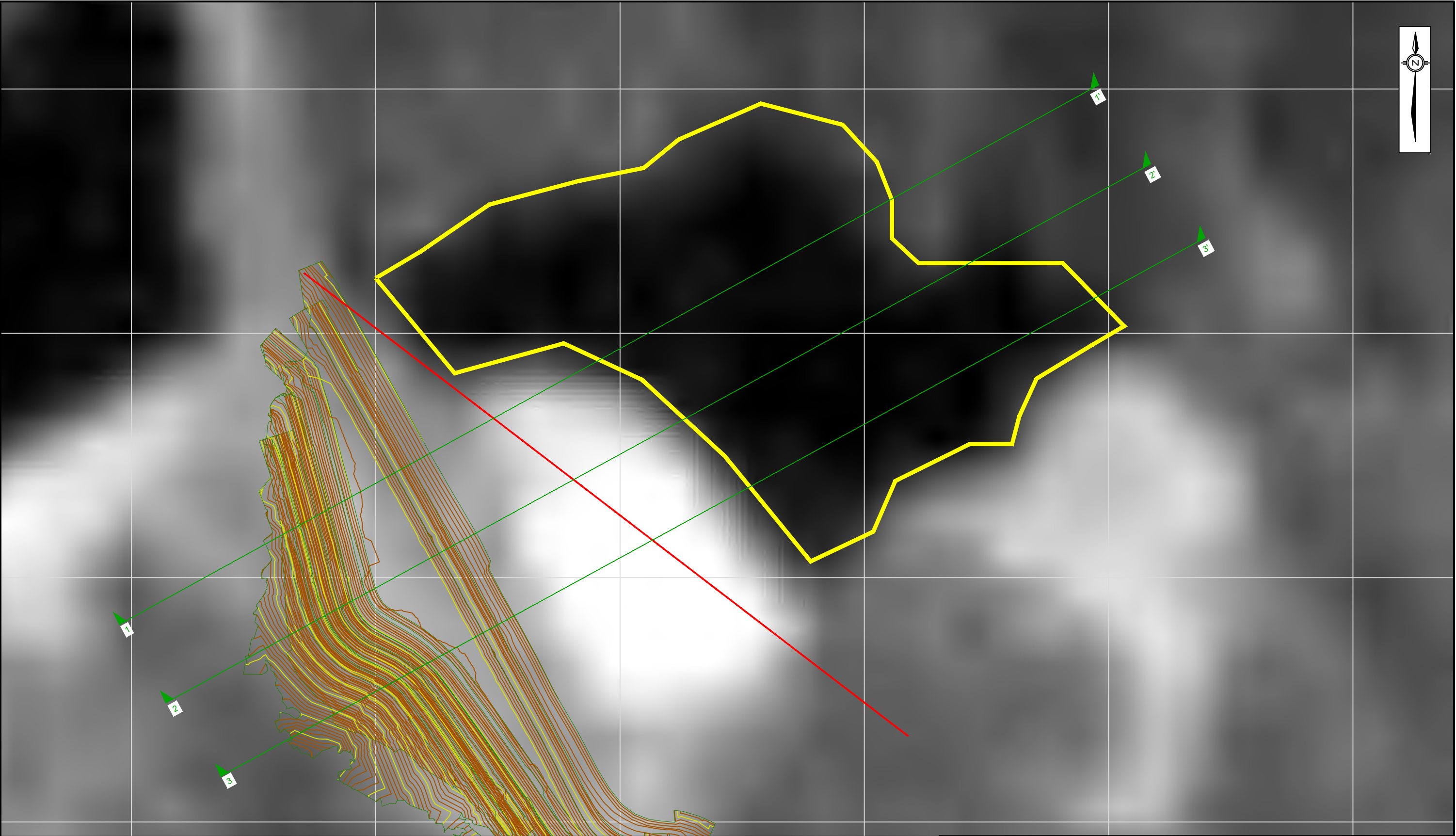
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

|                                                                                                                       |                          |                         |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------|
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |                         |
| TITLE<br>SATELLITE IMAGES<br>AUGUST 16, 1998 (S)<br>RAISE #10<br>DAM CREST EL. 910 m                                  |                          |                         |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-81 |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

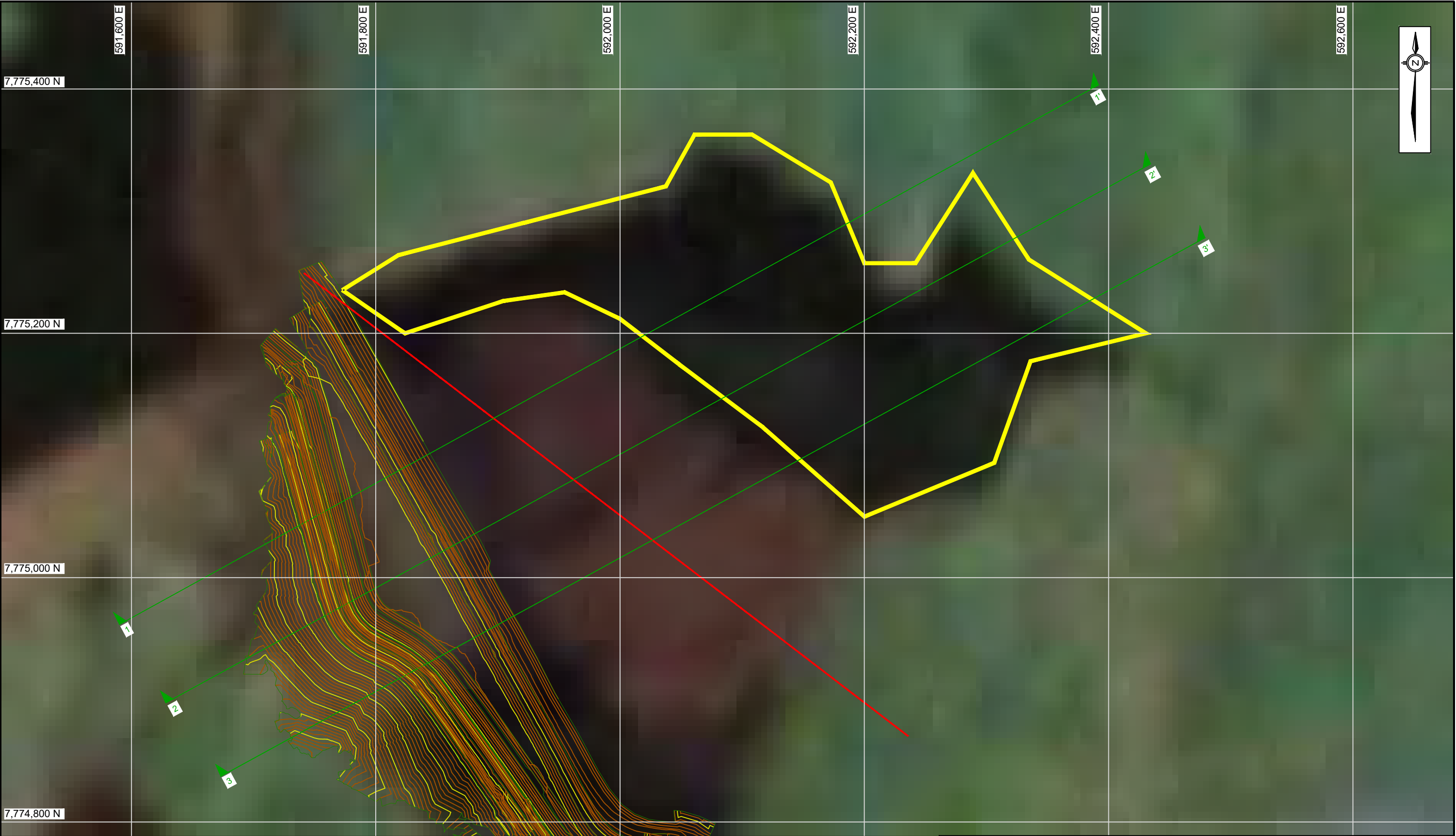
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>AUGUST 19, 1999 (S)<br>RAISE #10<br>DAM CREST EL. 910 m                                |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-82                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

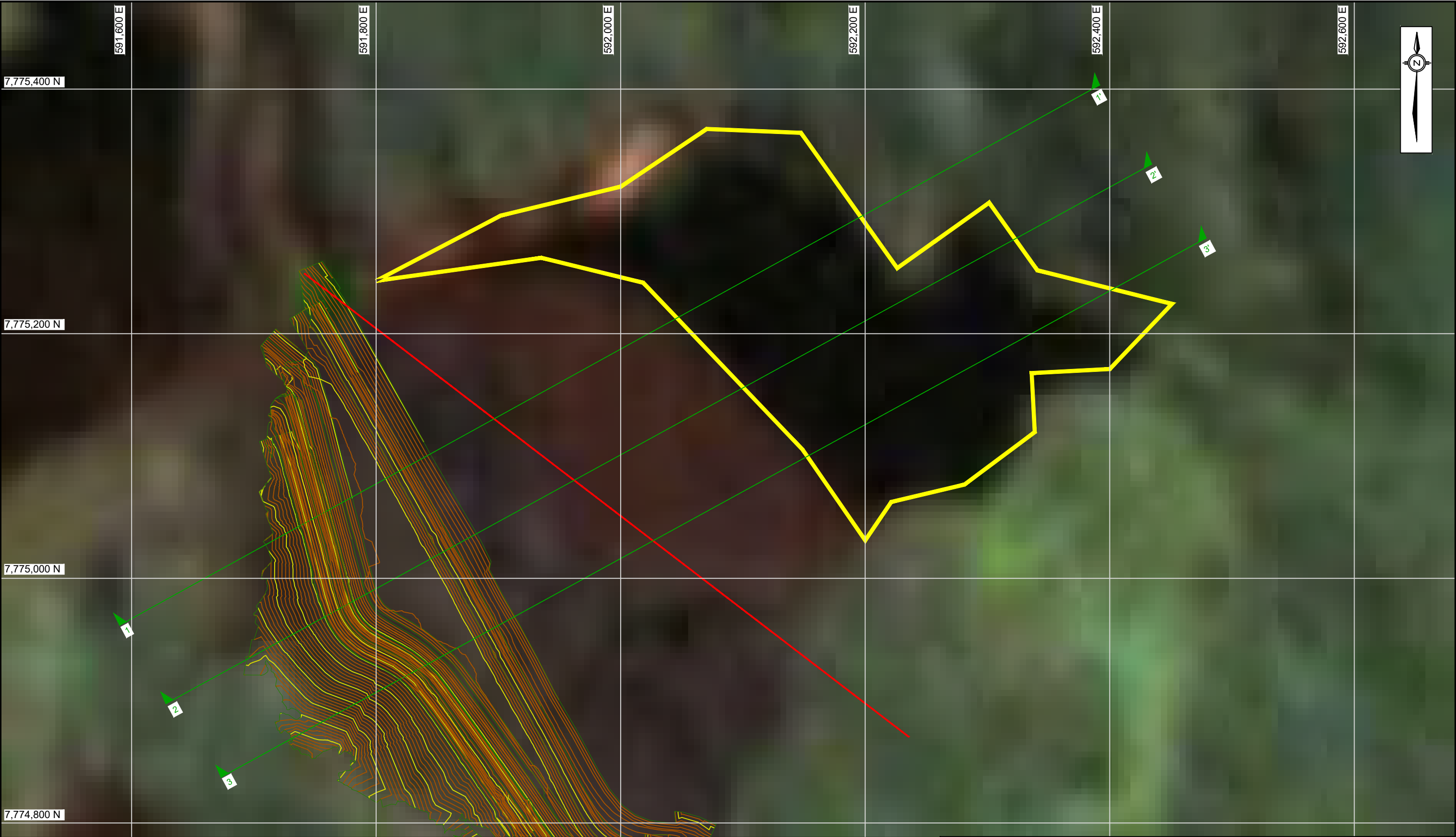
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
DECEMBER 1999  
RAISE #10  
DAM CREST EL. 910.0 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-83 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

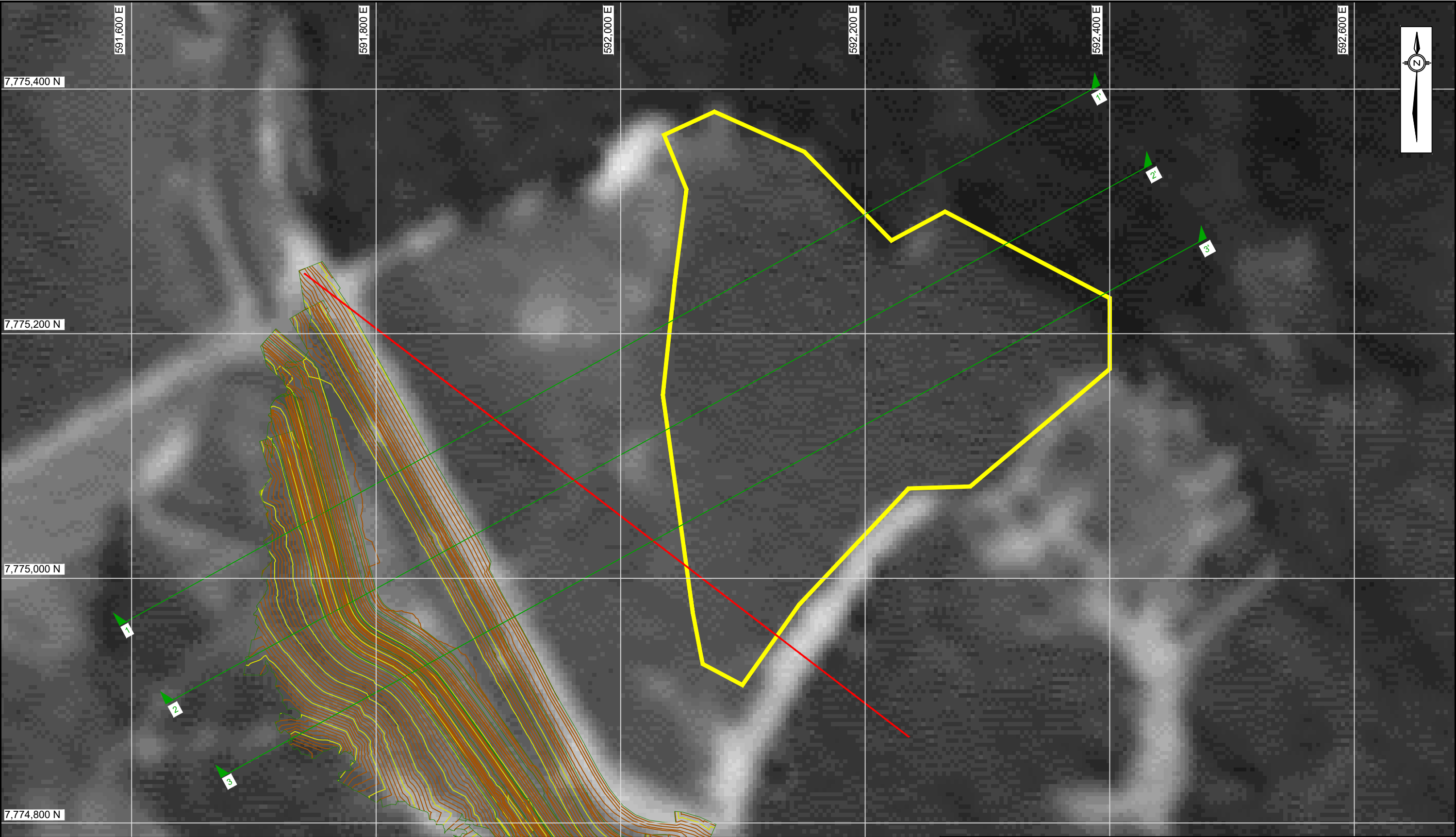
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
APRIL 2000  
RAISE #10  
DAM CREST EL. 910.0 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-84 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

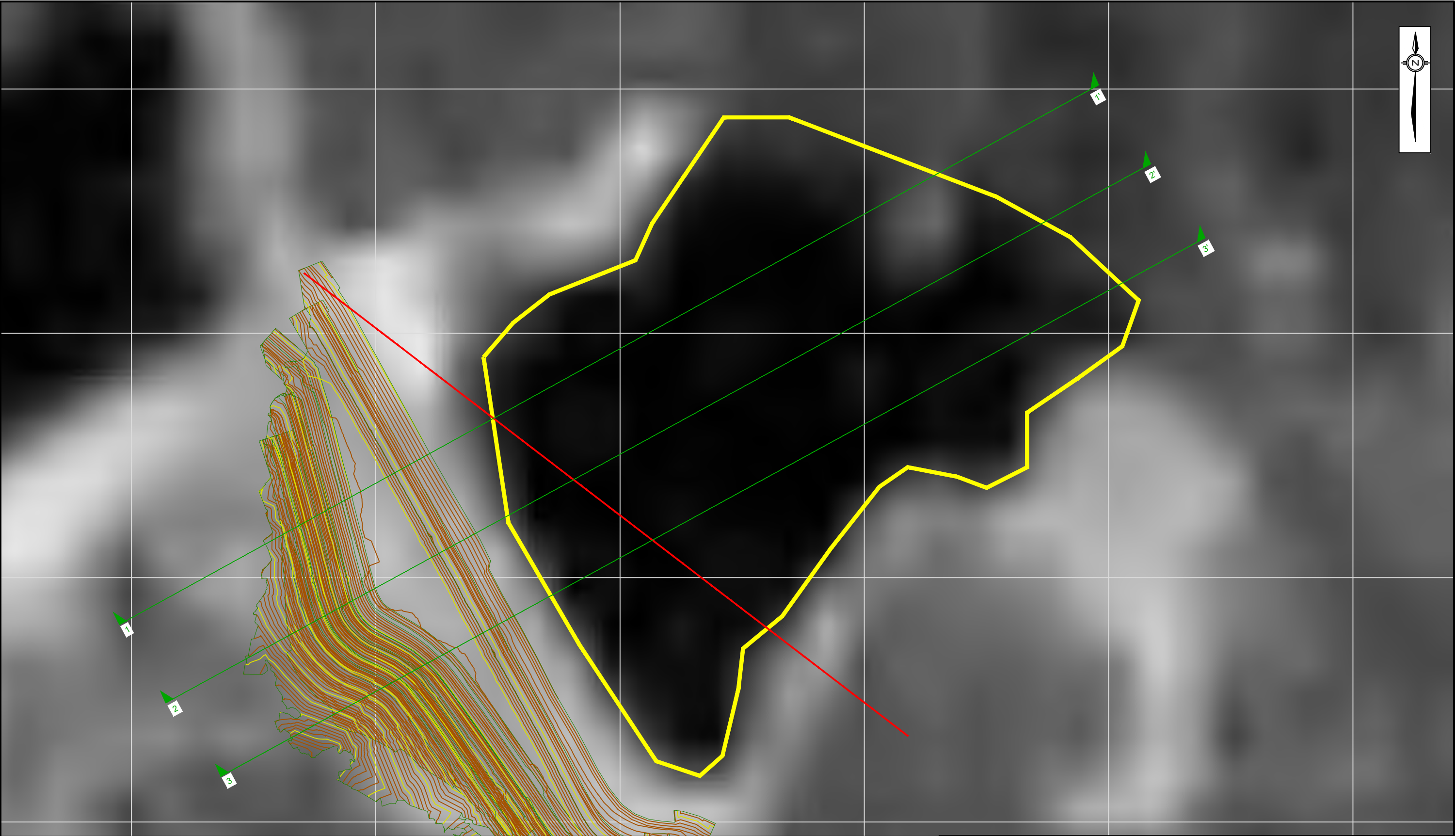
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
JULY 2000  
RAISE #10  
DAM CREST EL. 910.0 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-85 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

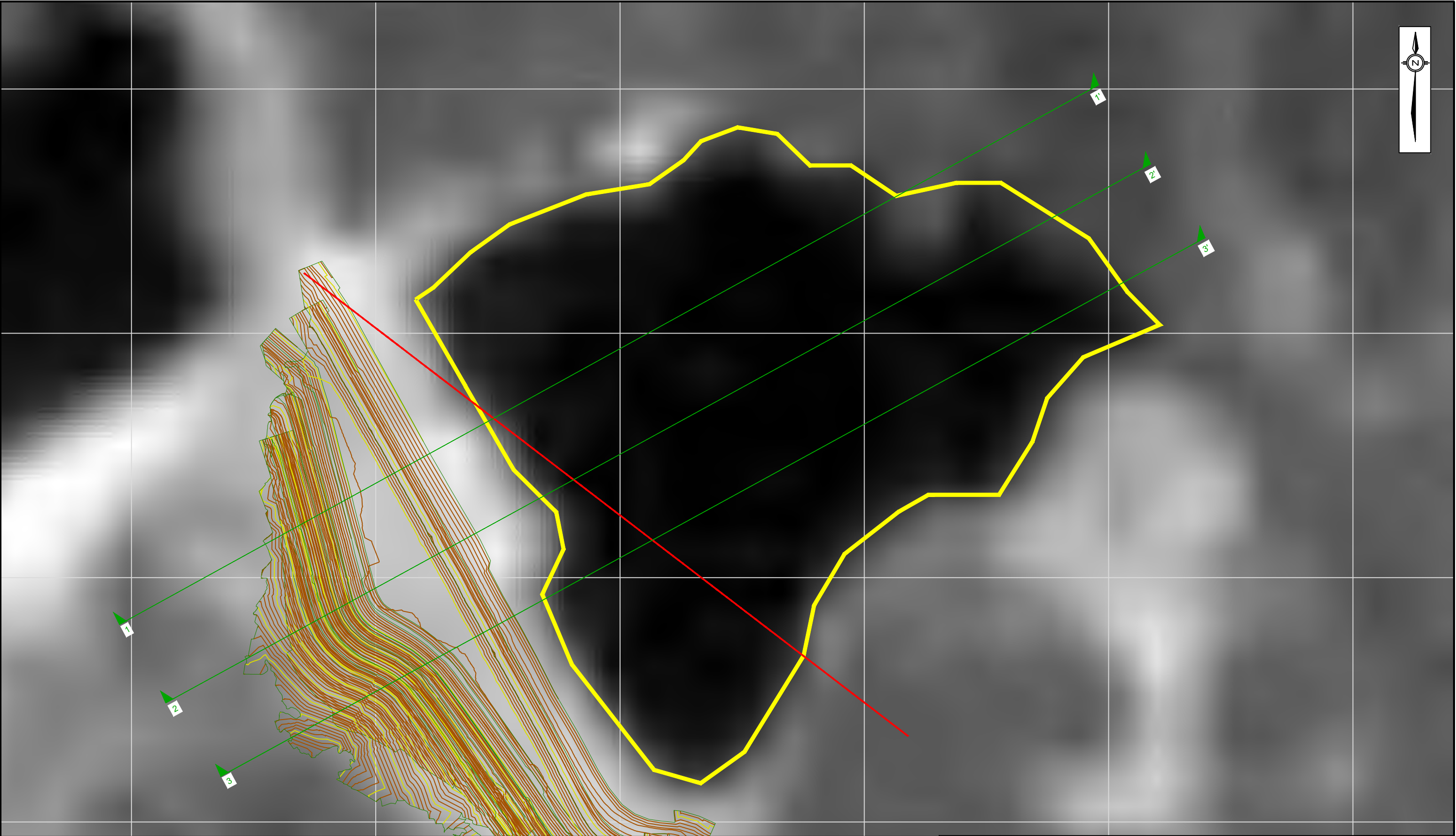
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
AUGUST 21, 2000 (S)  
RAISE #10  
DAM CREST EL. 910 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-86 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                                 |                   |
|-------------------------------------------------|-------------------|
| DESIGN SECTIONS                                 | 1 m CONTOURS      |
| POND OUTLINE                                    | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

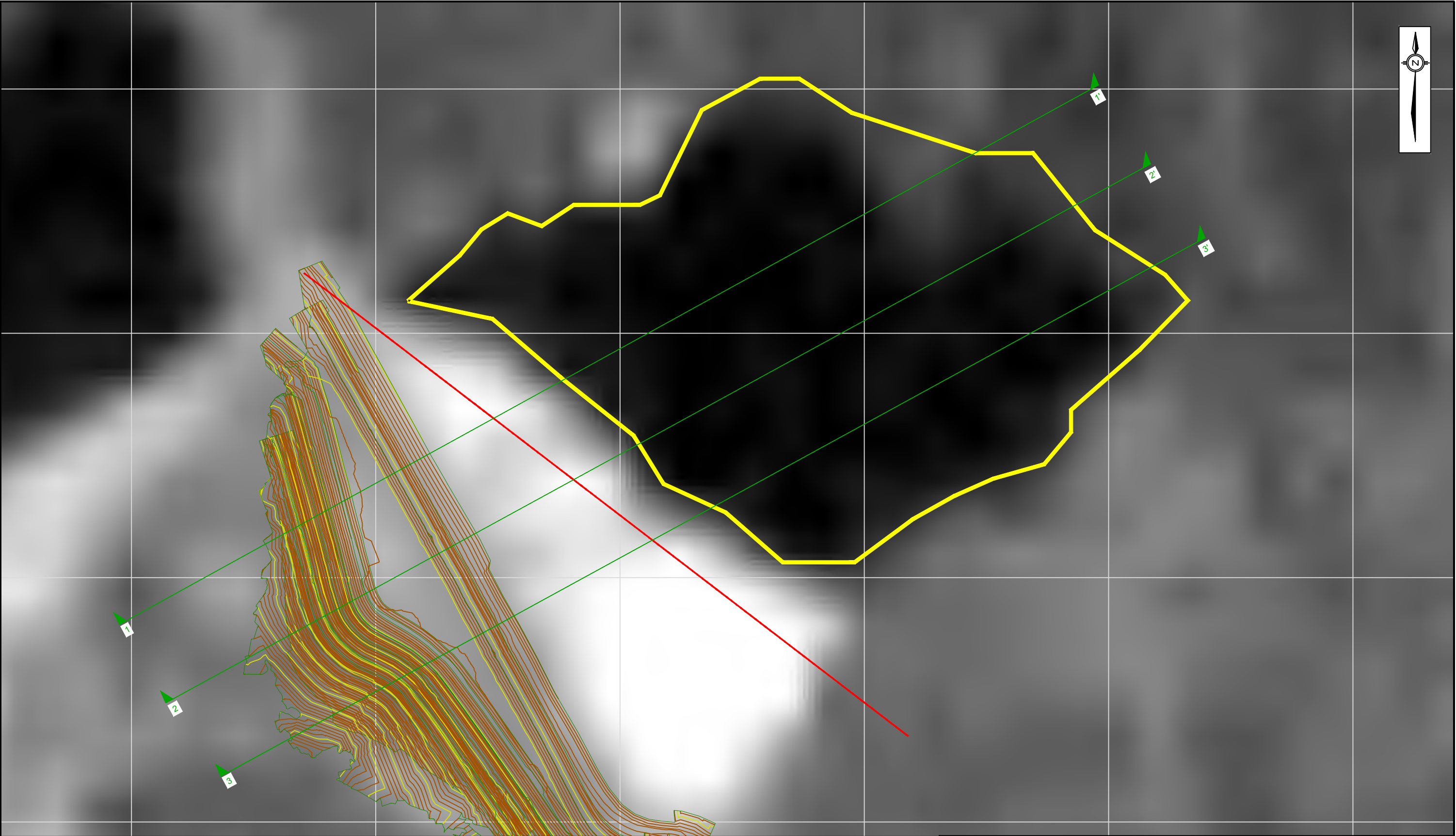
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
SEPTEMBER 22, 2000 (S)  
RAISE #10  
DAM CREST EL. 910 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-87 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

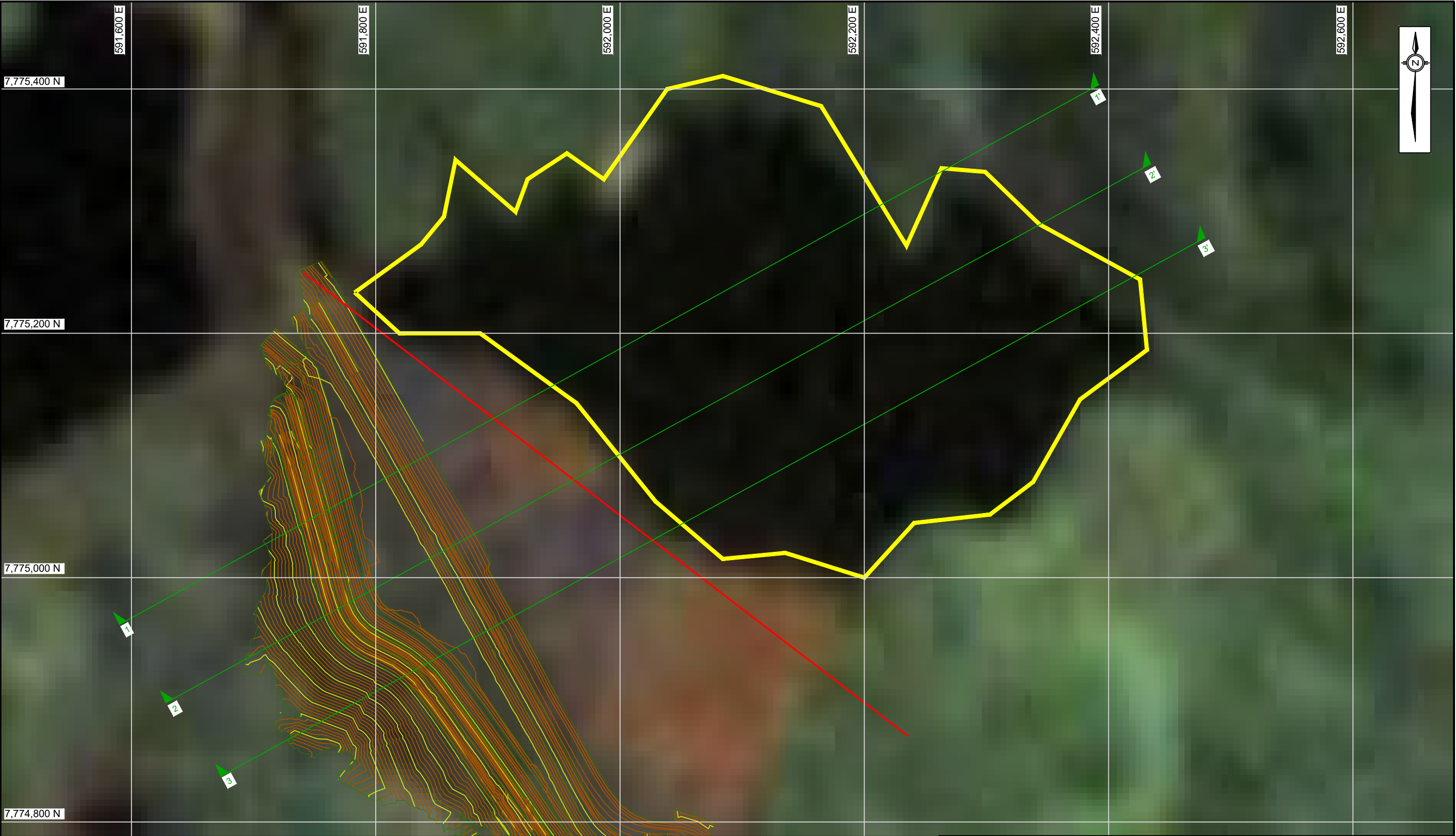
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELITE IMAGES  
APRIL 18, 2001  
RAISE #10  
DAM CREST EL. 910 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-88 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

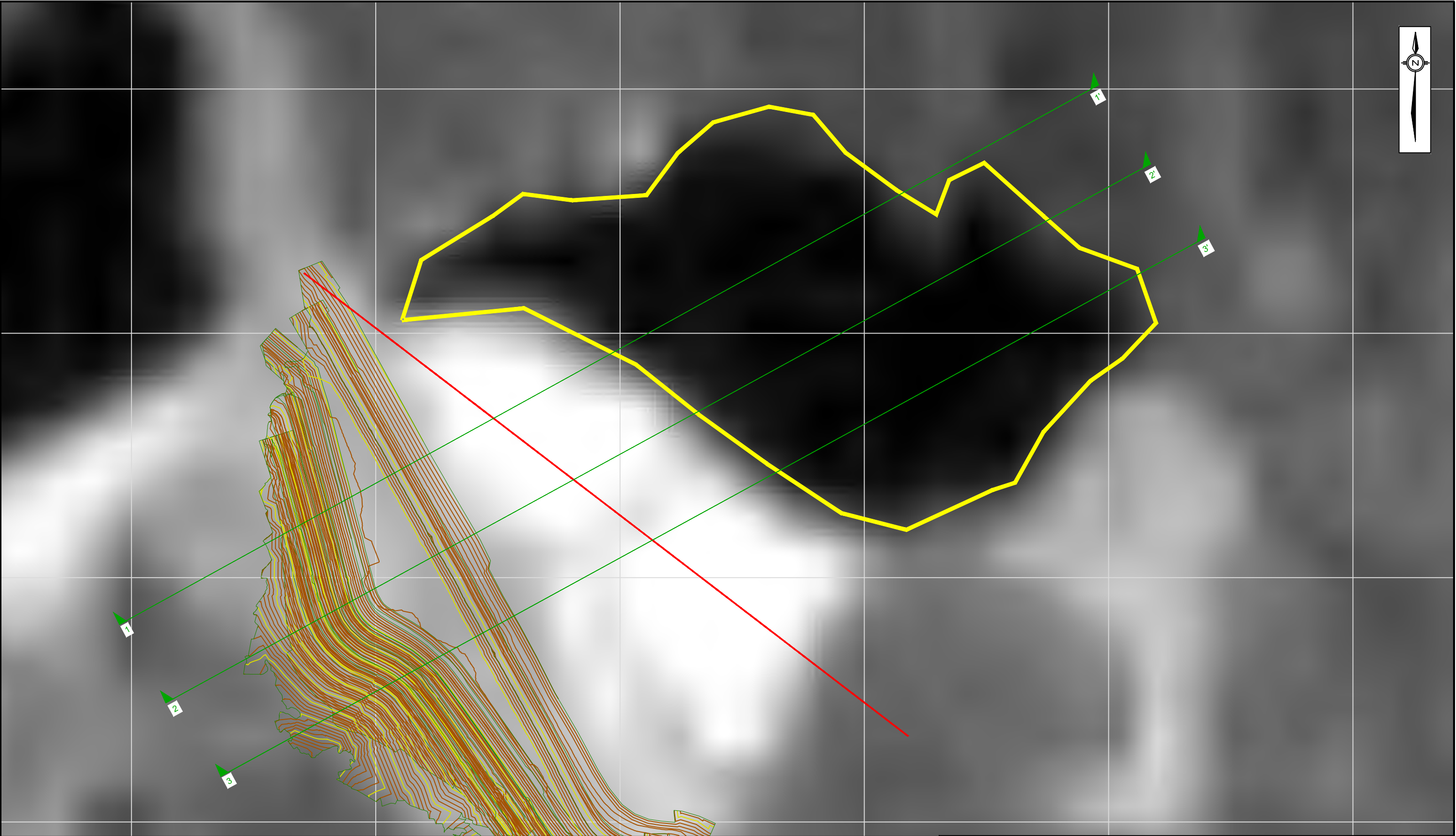
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
MAY 2001  
RAISE #10  
DAM CREST EL. 910.0 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-89 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

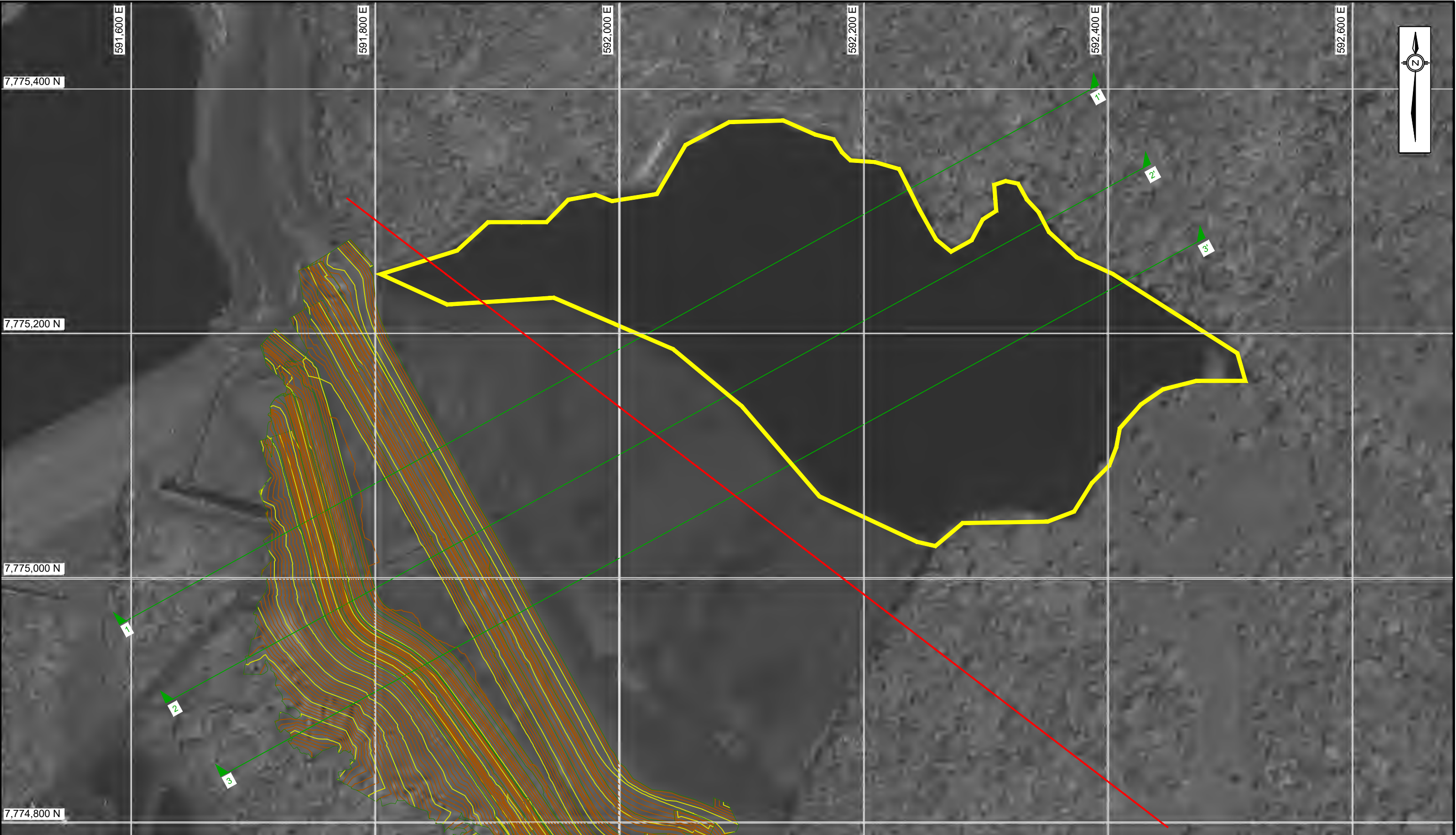
**LEGEND:**

|                                                 |                   |
|-------------------------------------------------|-------------------|
| DESIGN SECTIONS                                 | 1 m CONTOURS      |
| POND OUTLINE                                    | 5 m CONTOURS      |
| MODELED POND BOUNDARY<br>(AVERAGE FOR RAISE 10) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>SEPTEMBER 9, 2001 (S)<br>RAISE #10<br>DAM CREST EL. 910 m                              |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-90                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

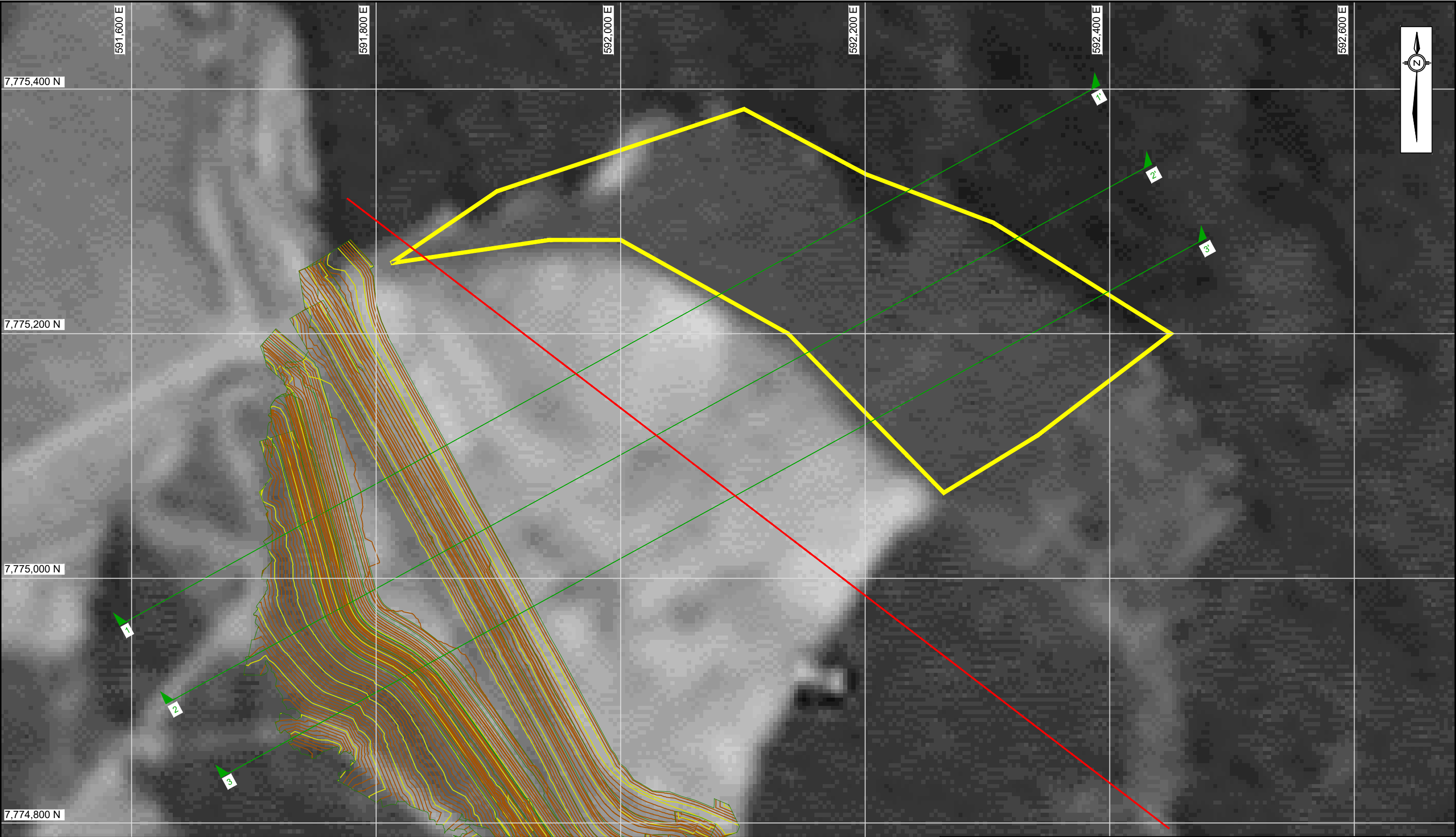
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 11) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                |                          |
|                                                                                                                       |                          |
|                                                                                                                       |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br>SATELLITE IMAGES<br>OCTOBER 13, 2001<br>RAISE #11<br>DAM CREST EL. 916.5 m                                   |                          |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A01 |
| FIG. No.<br>FIGURE I-91                                                                                               |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 11) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

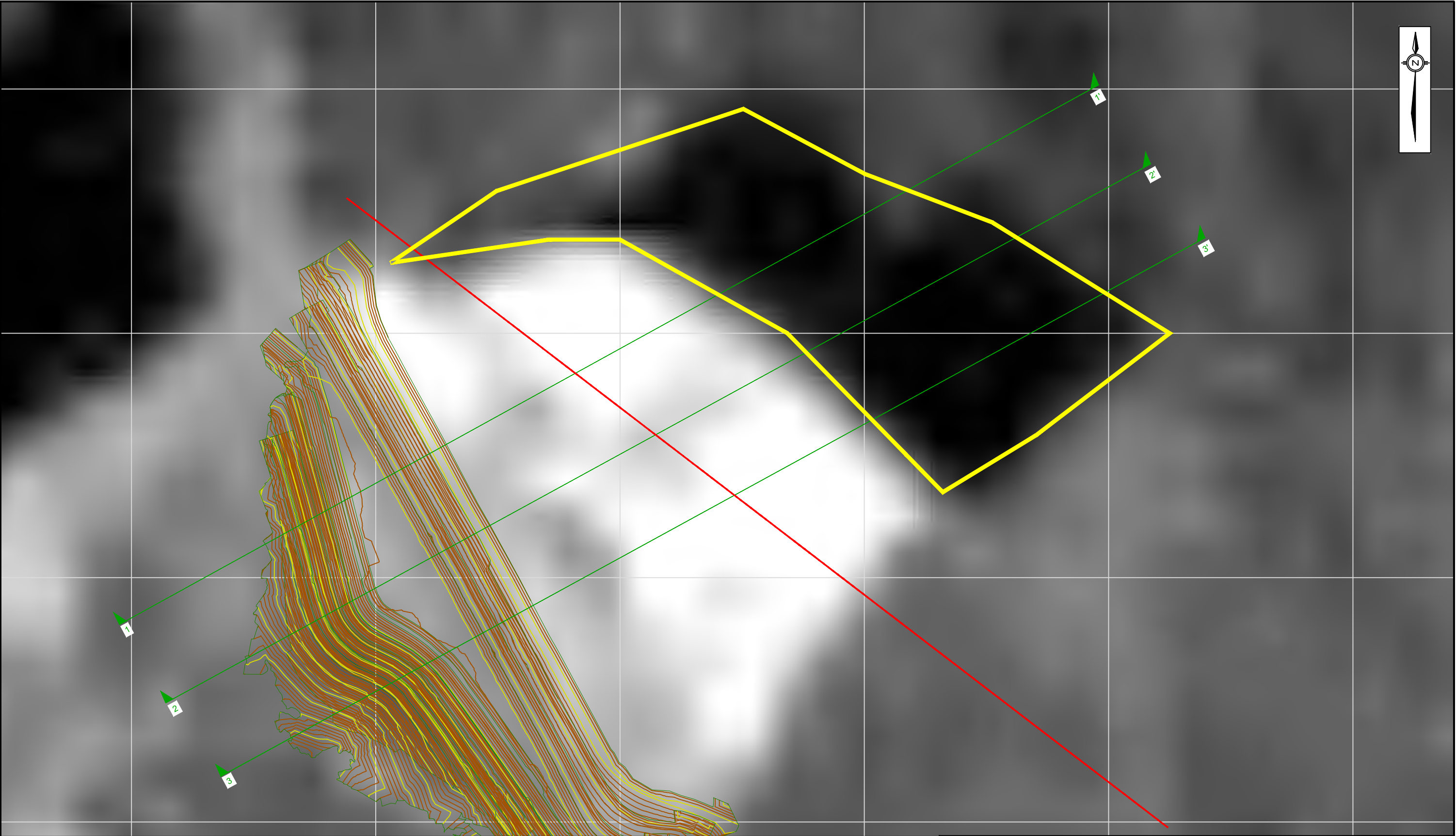
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
APRIL 21, 2002  
RAISE #11  
DAM CREST EL. 916.5 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-92 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

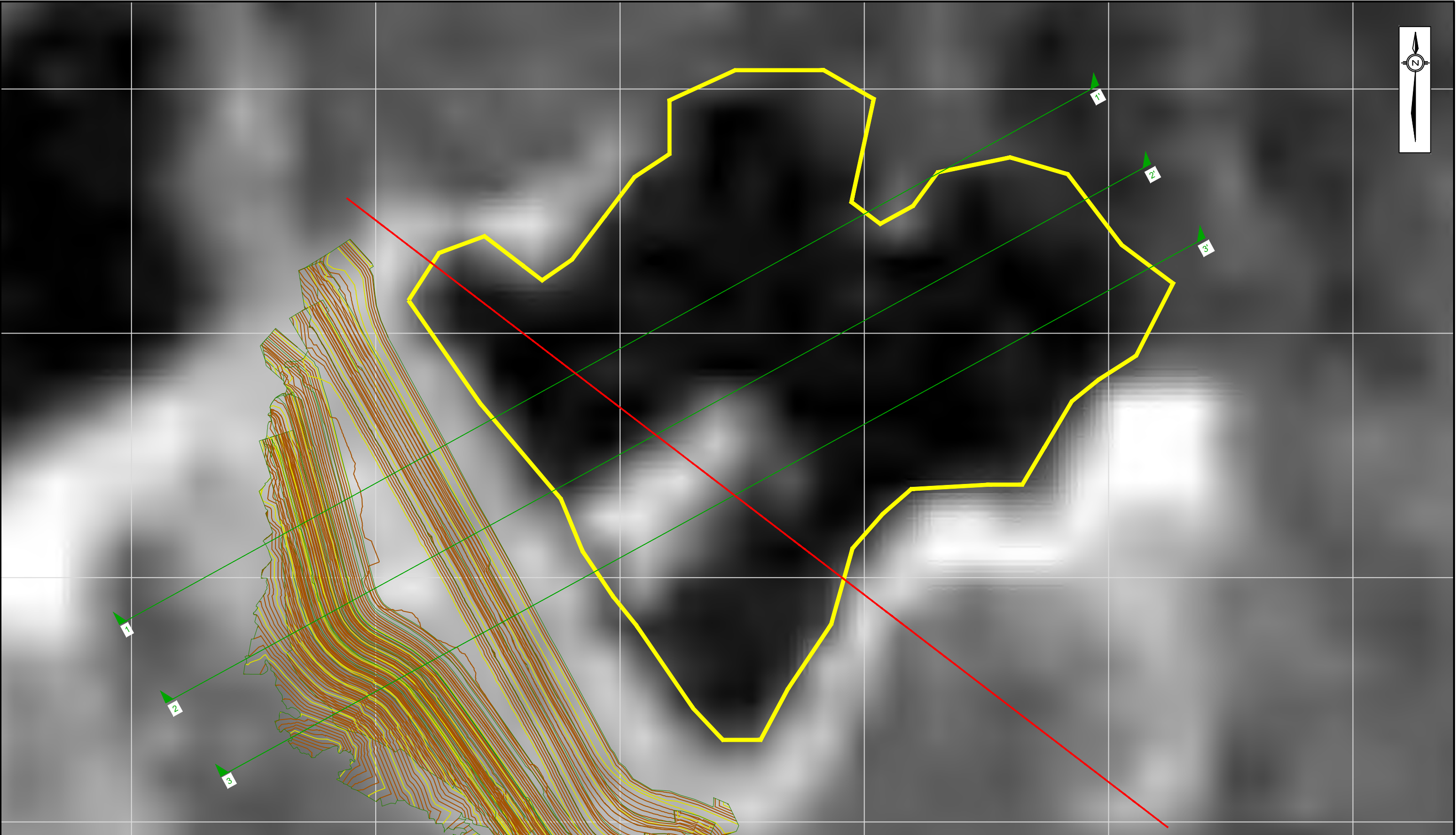
**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 11) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>APRIL 21, 2002 (S)<br>RAISE #11<br>DAM CREST EL. 916.5 m                               |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-93                                                                                                |             |



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 11) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>JULY 26, 2002 (S)<br>RAISE #11<br>DAM CREST EL. 916.5 m                                |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-94                                                                                                |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 11) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>JANUARY 10, 2003<br>RAISE #11<br>DAM CREST EL. 916.5 m                                 |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-95                                                                                    |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 11) | DAM RAISE OUTLINE |

1:3,000 30 60

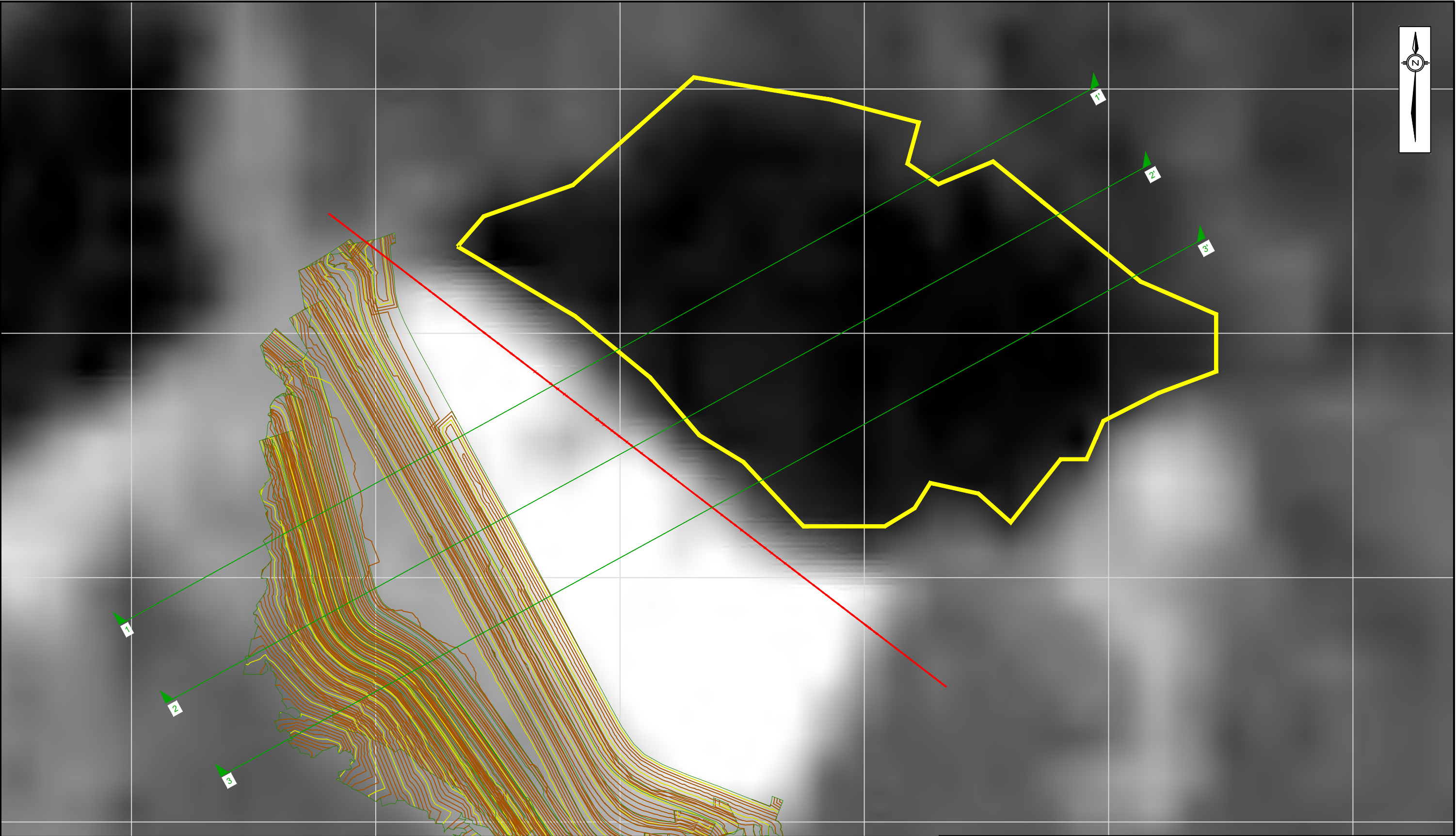
BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
MAY 18, 2003  
RAISE #11  
DAM CREST EL. 916.5 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-96 |
|------------------|--------------------------|-------------------------|



**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 12) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

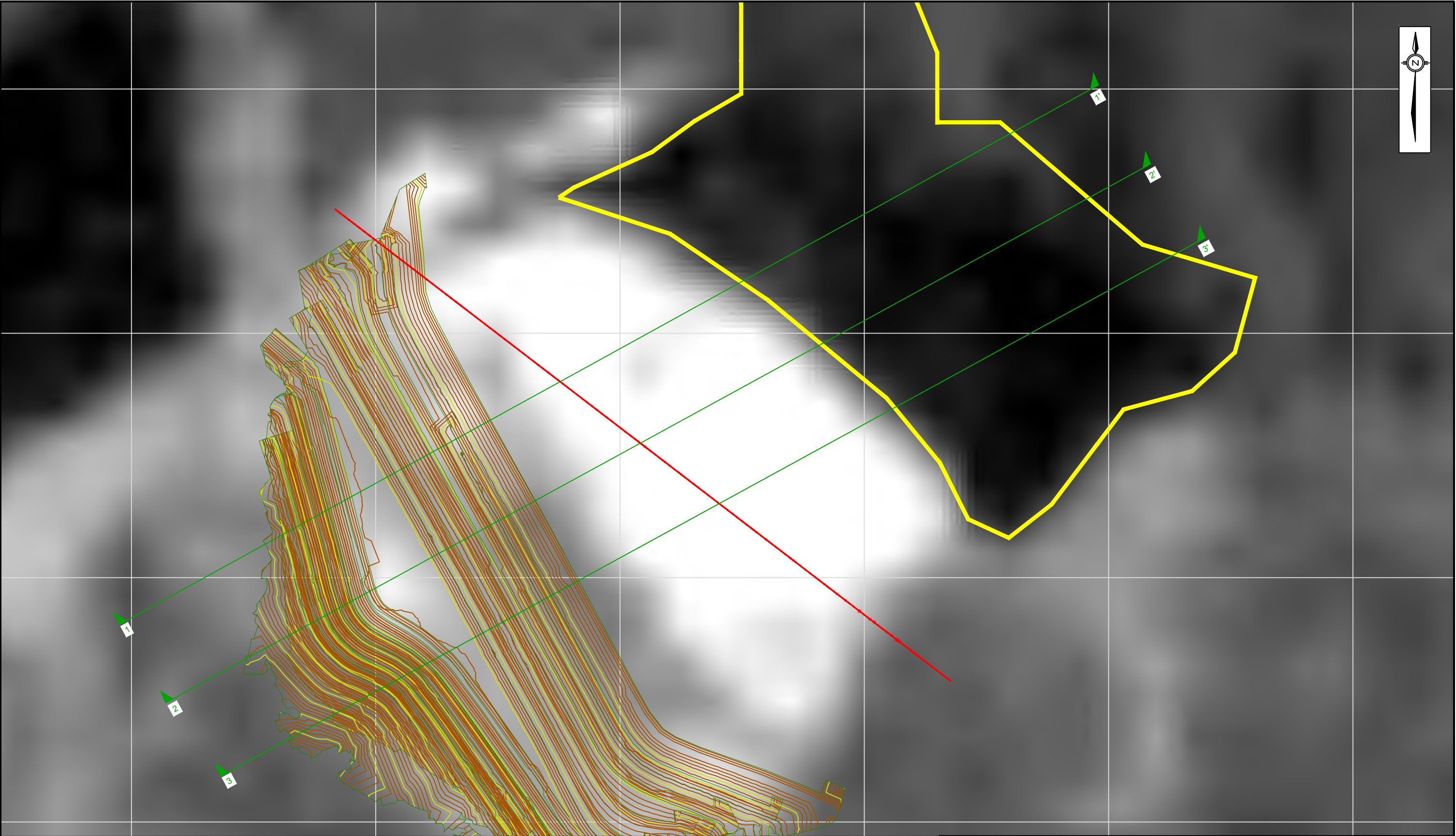
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
AUGUST 14, 2003 (S)  
RAISE #12  
DAM CREST EL. 922.5 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-97 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT

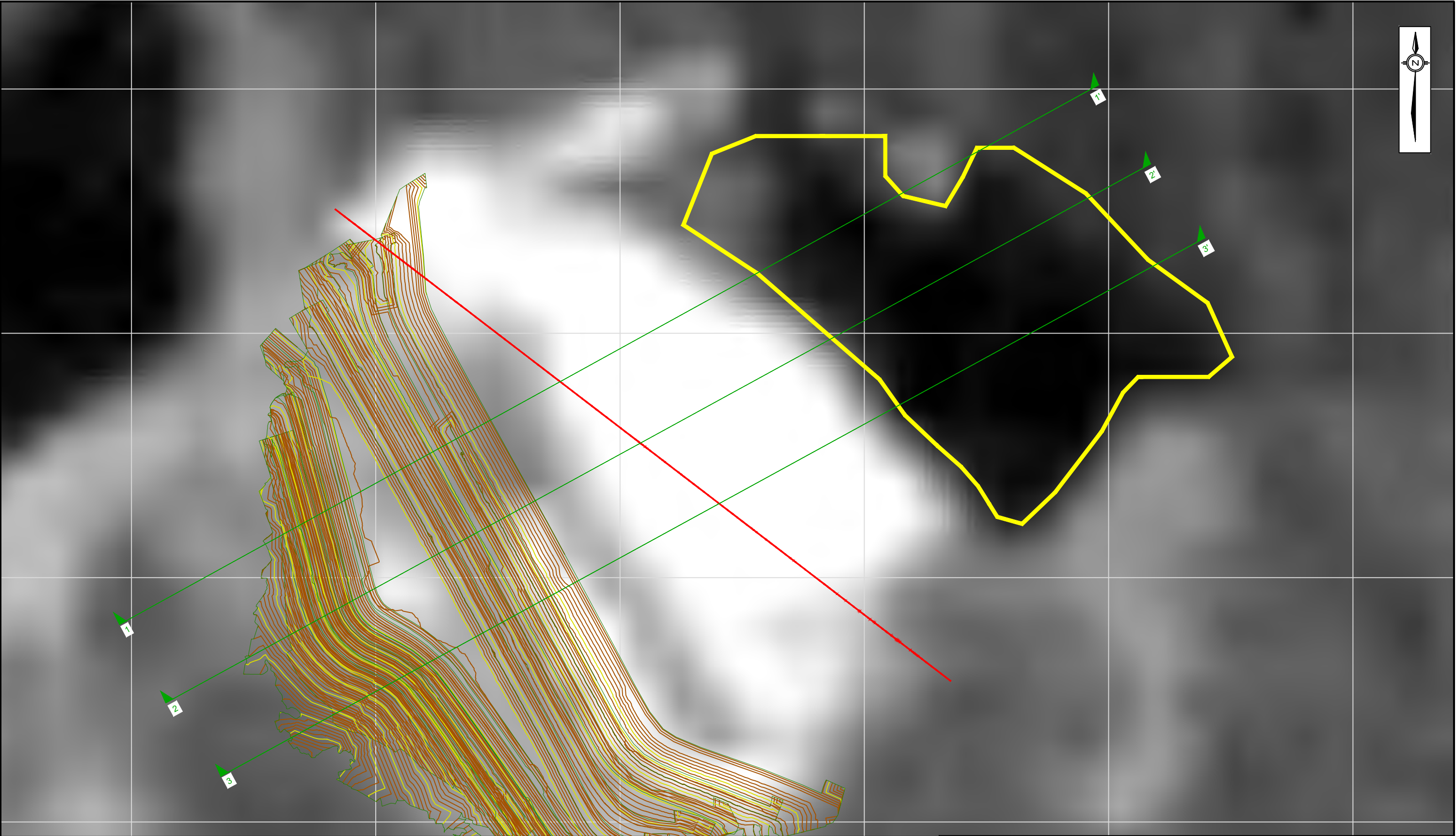
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
JULY 31, 2004 (S)  
RAISE #13  
DAM CREST EL. 929.5 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-98 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

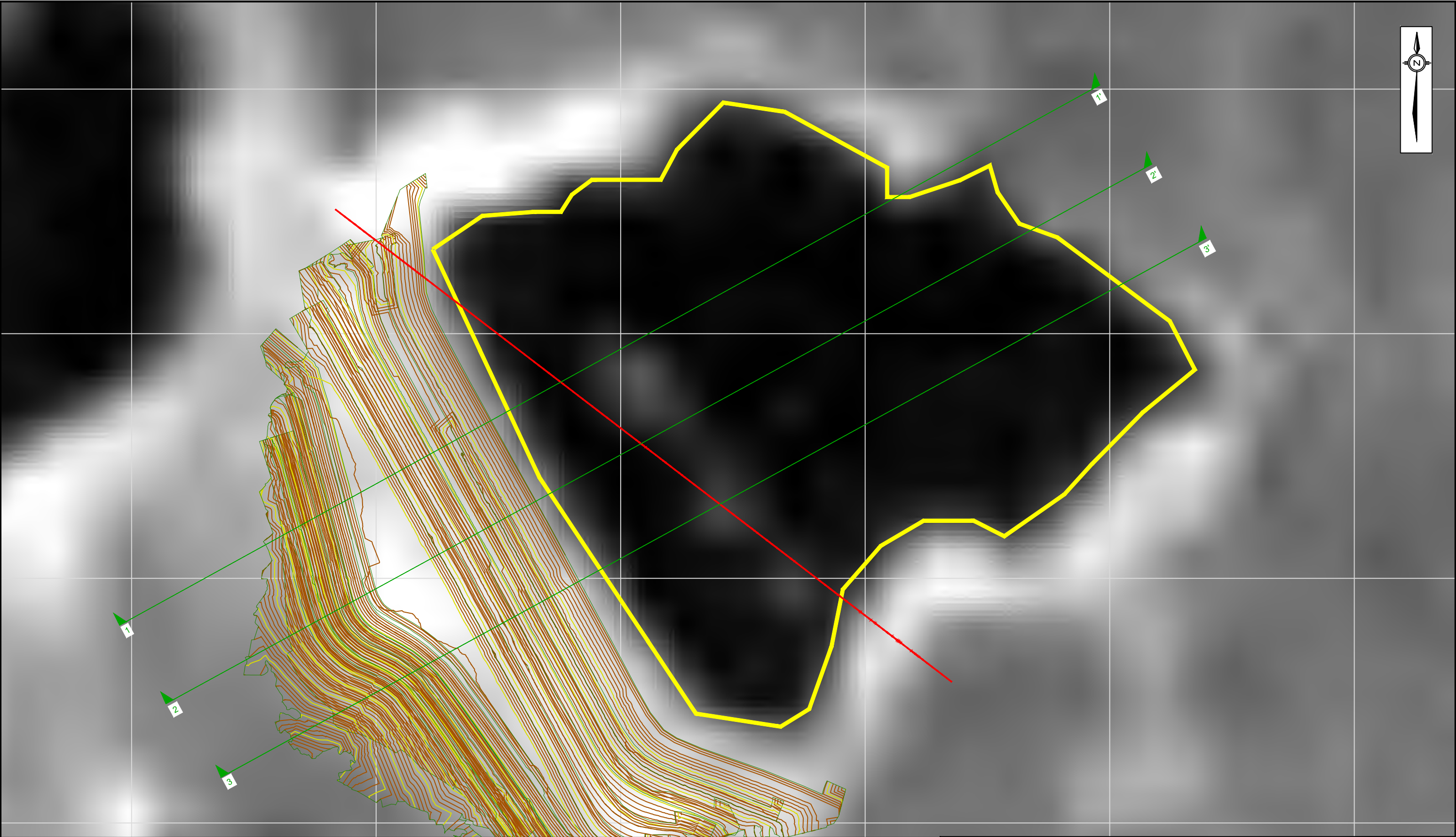
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
AUGUST 16, 2004 (S)  
RAISE #13  
DAM CREST EL. 929.5 m**

|                  |                          |                         |
|------------------|--------------------------|-------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-99 |
|------------------|--------------------------|-------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

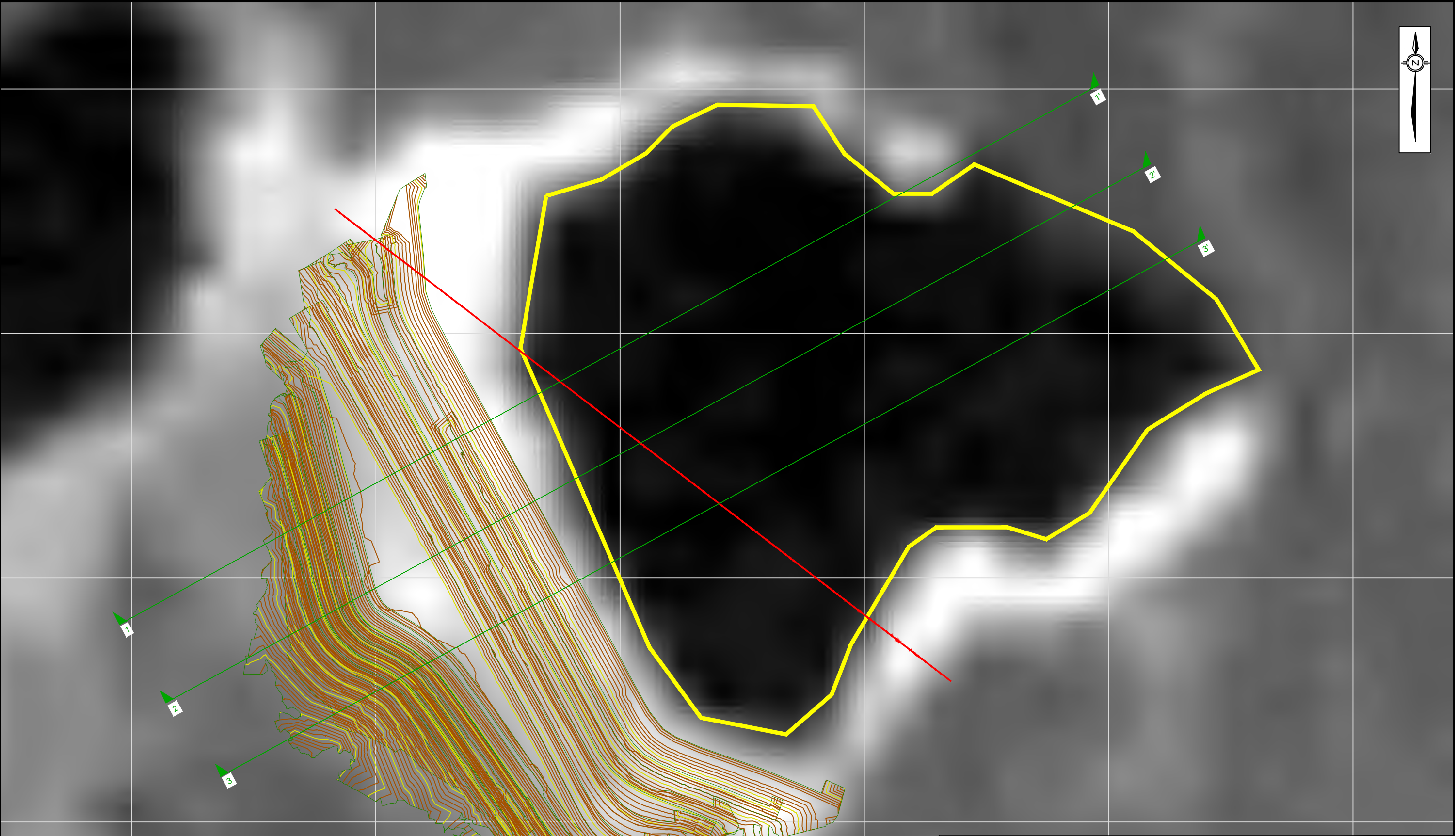
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>DECEMBER 6, 2004 (S)<br>RAISE #13<br>DAM CREST EL. 929.5 m                             |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-100                                                                                               |             |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT

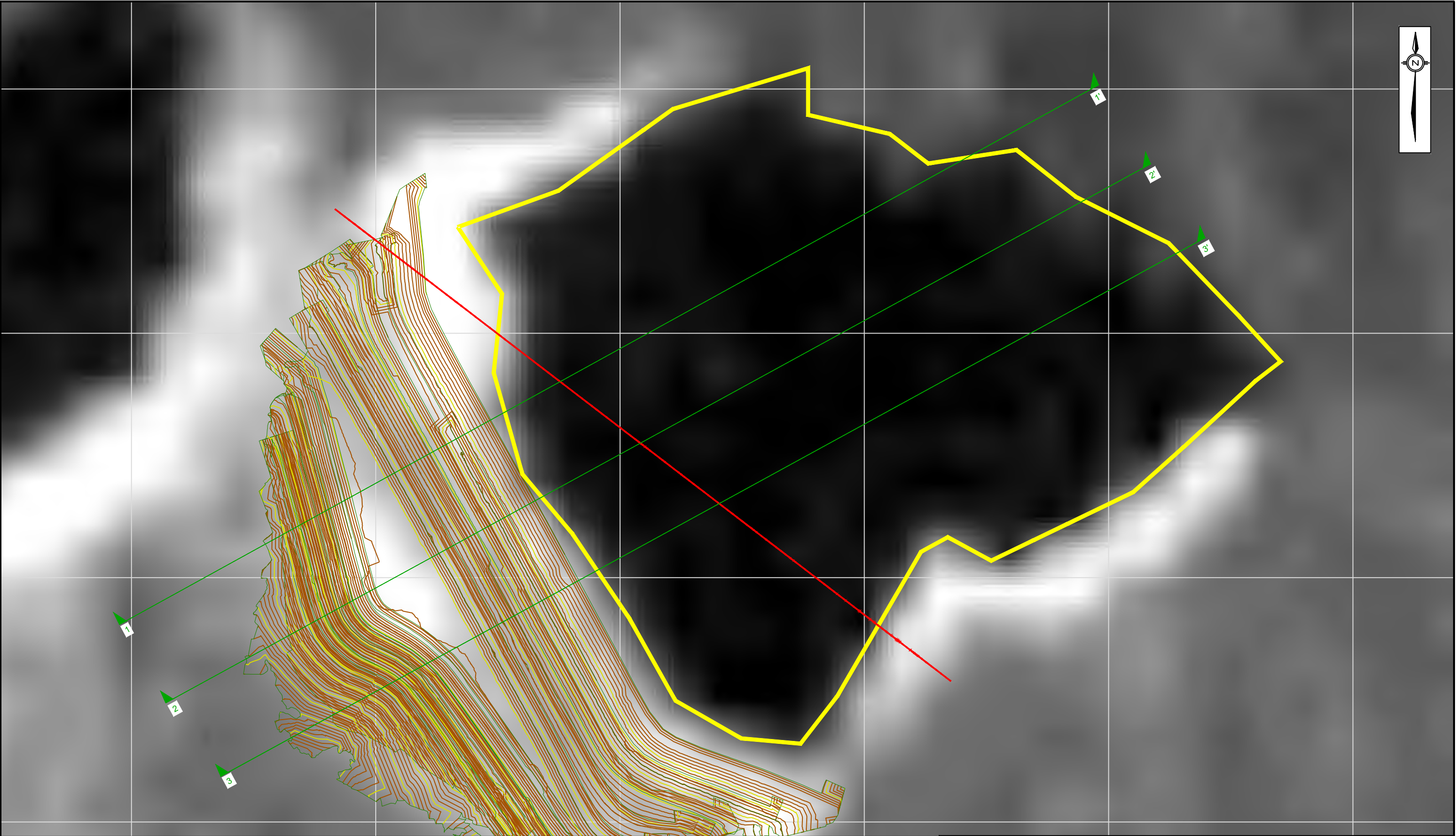
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
FEBRUARY 24, 2005 (S)  
RAISE #13  
DAM CREST EL. 929.5 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-101 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT

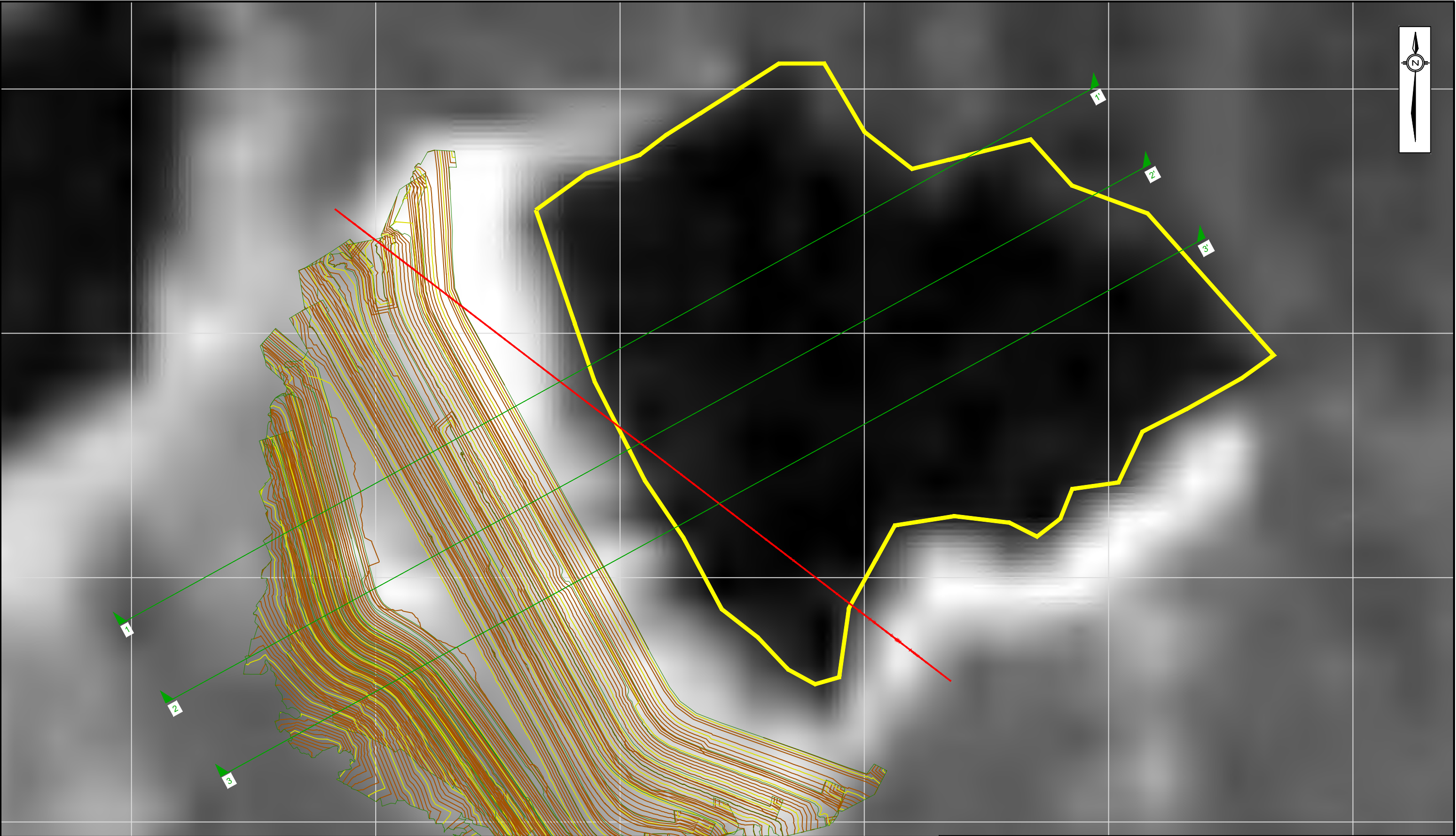
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES  
APRIL 13, 2005 (S)  
RAISE #13  
DAM CREST EL. 929.5 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-102 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- SATELLITES IMAGE WITH (S) IN TITLE REFER TO THE 93 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

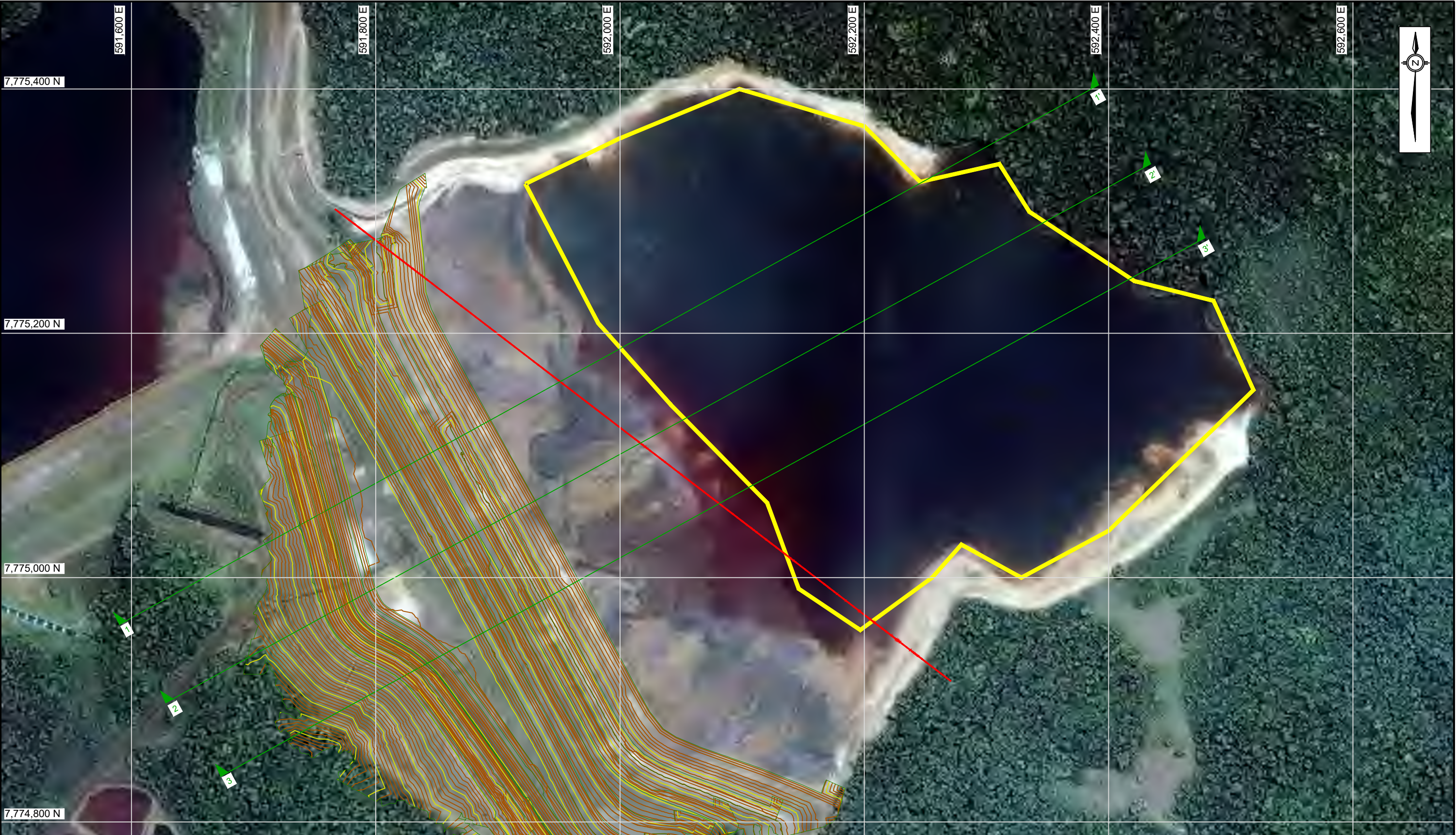
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
AUGUST 19, 2005 (S)  
RAISE #13  
DAM CREST EL. 929.5 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-103 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

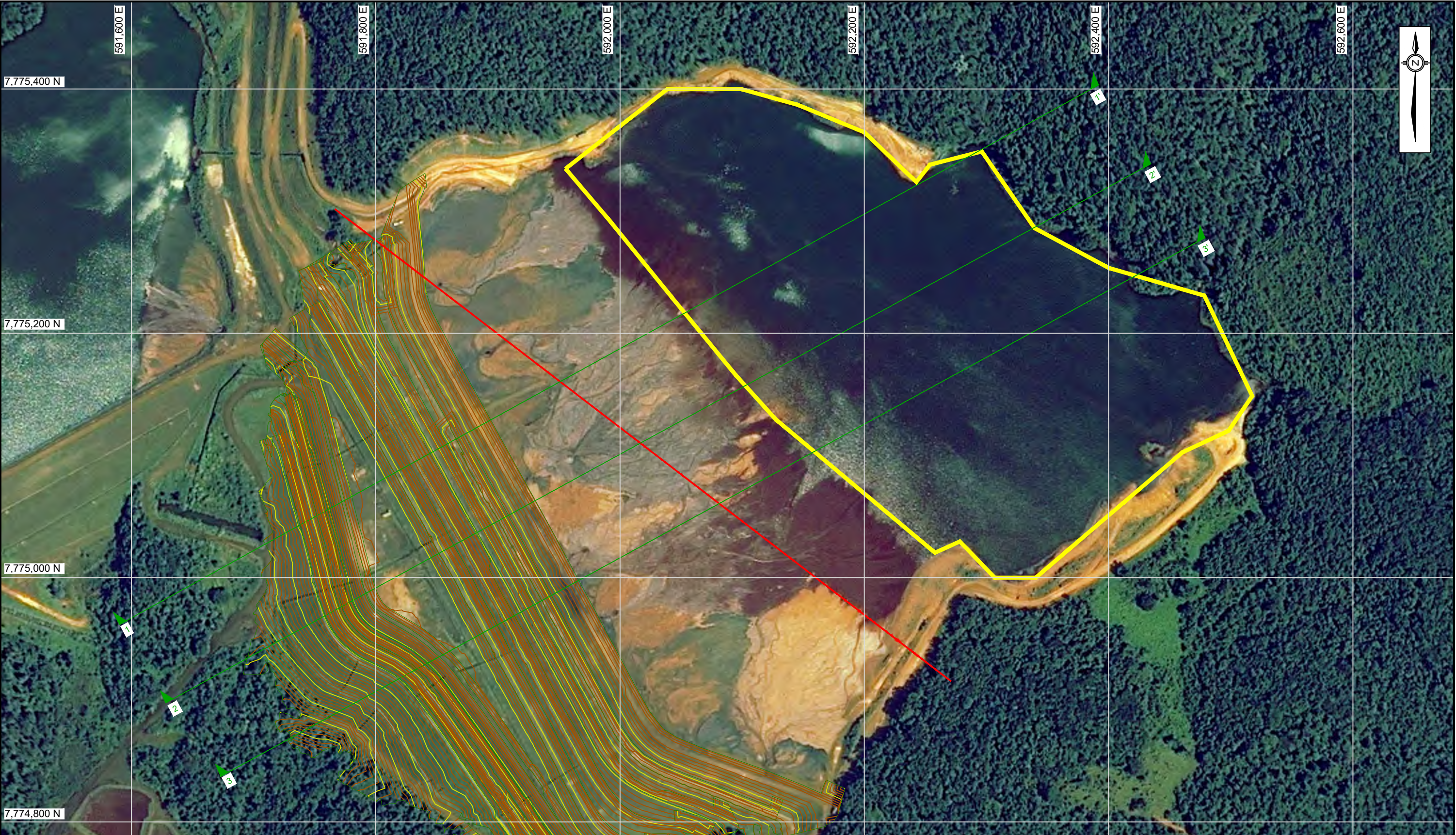
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
OCTOBER 5, 2005  
RAISE #13  
DAM CREST EL. 929.5 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-104 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

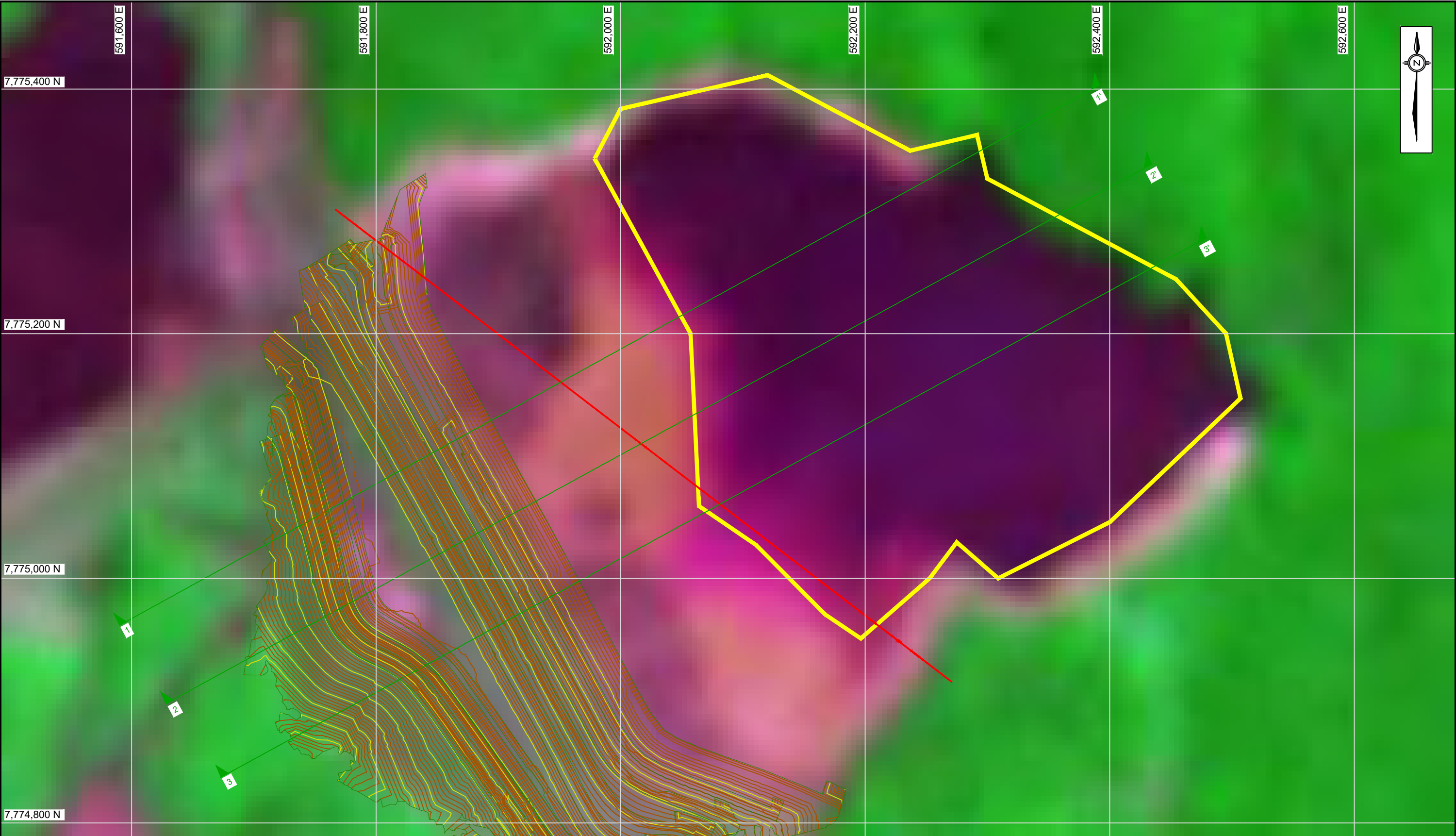
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>JANUARY 26, 2006<br>RAISE #13<br>DAM CREST EL. 929.5 m                                 |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-105                                                                                   |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- SINCE WATER ABSORBS NEAR-INFRARED LIGHT, WATER OR DAMP AREAS WILL LOOK RED IN A RED-NIR-GREEN IMAGE

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

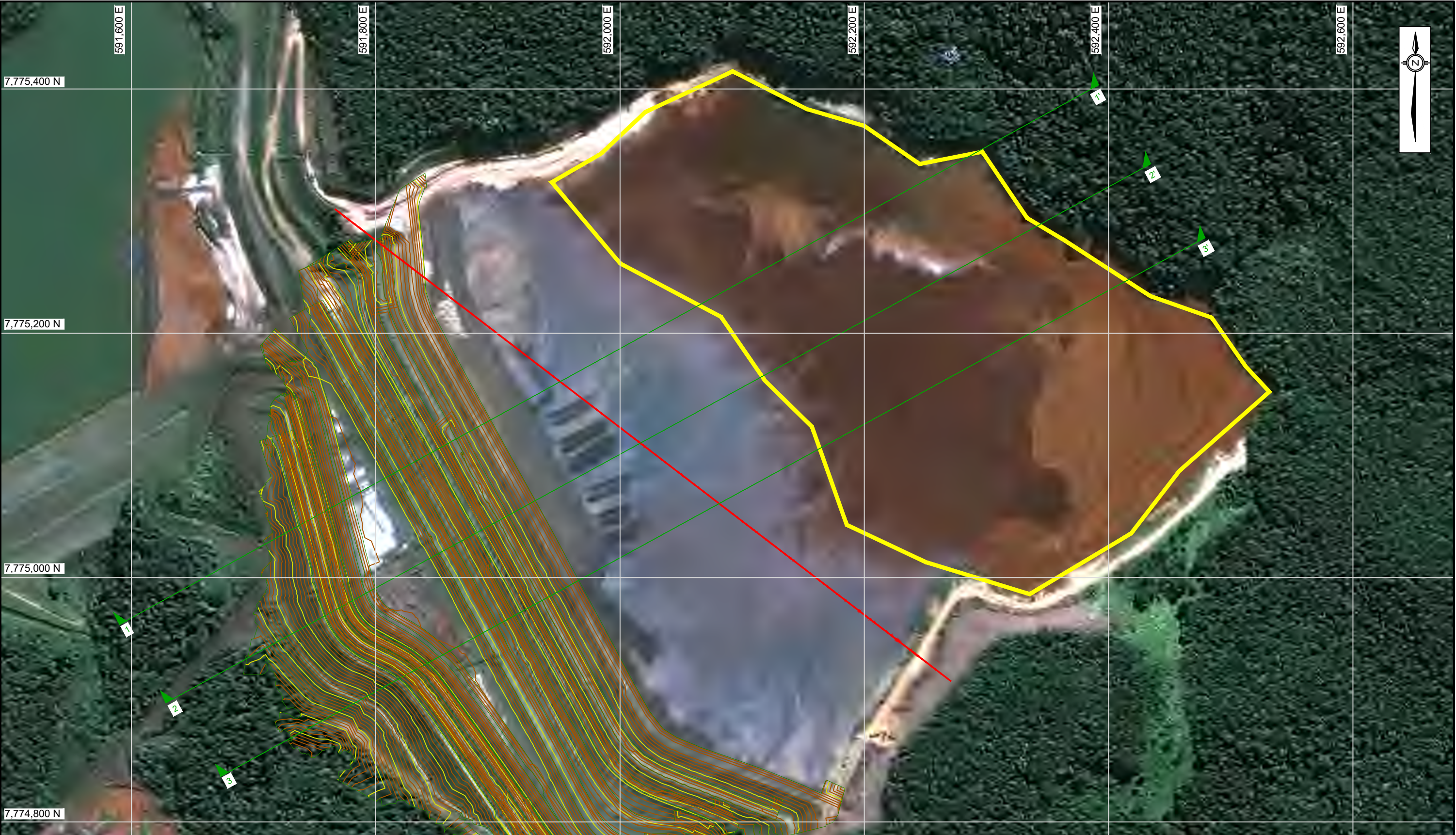
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
FEBRUARY 19, 2006  
RAISE #13  
DAM CREST EL. 929.5 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-106 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

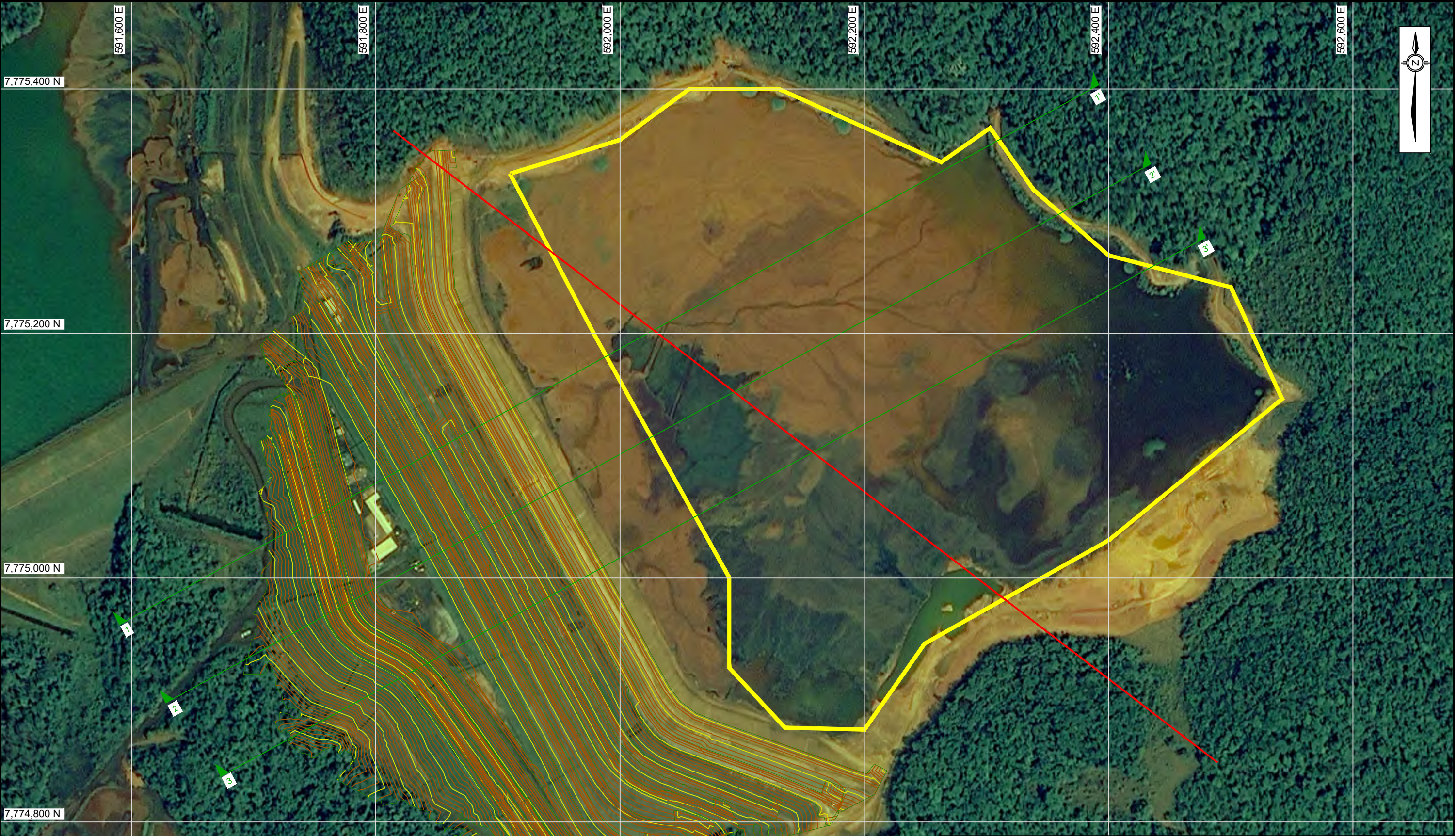
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 13) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>MAY 12, 2007<br>RAISE #13<br>DAM CREST EL. 929.5 m                                     |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-107                                                                                   |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

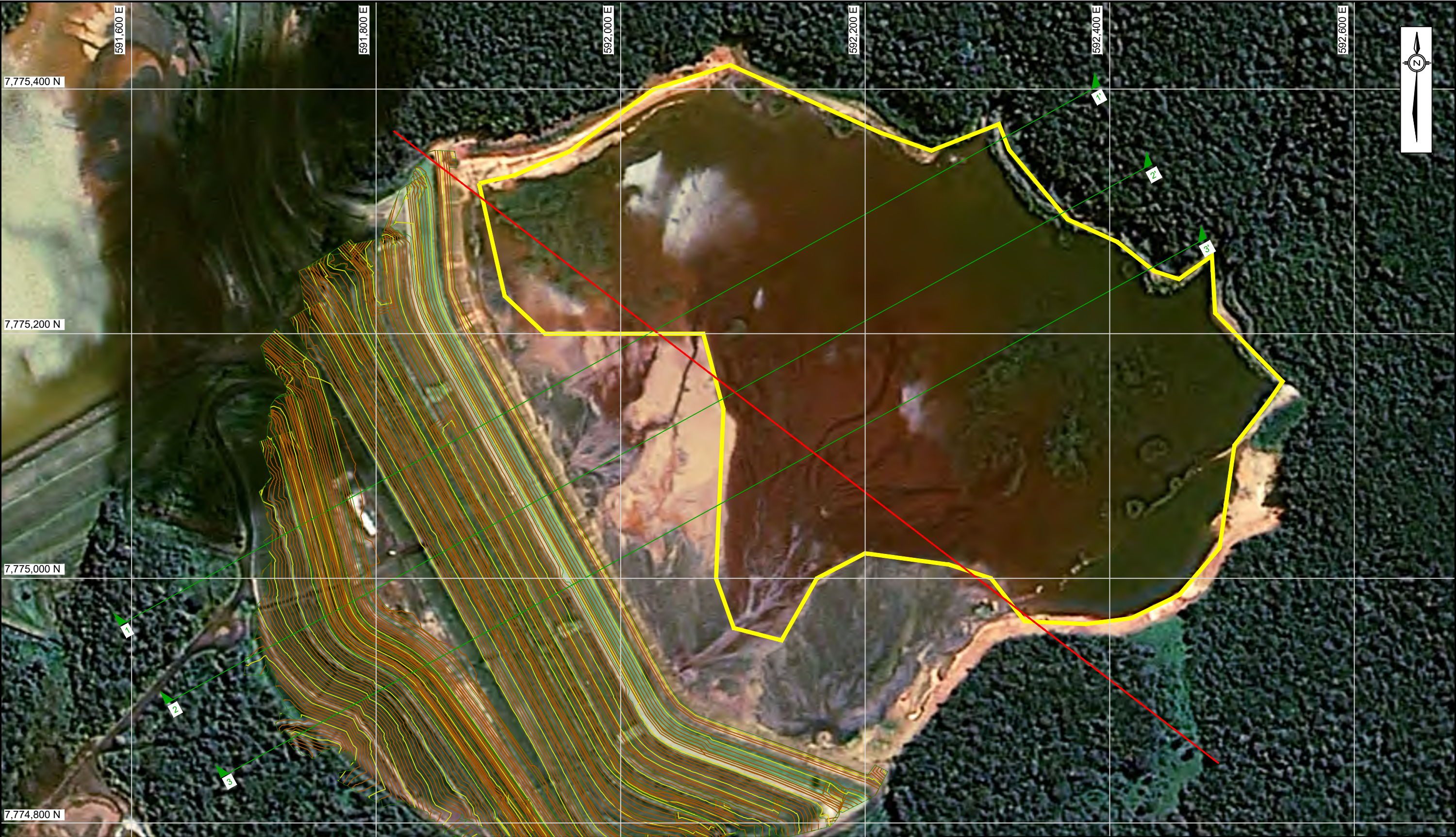
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>NOVEMBER 1, 2007<br>RAISE #14<br>DAM CREST EL. 937 m                                   |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-108                                                                                   |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

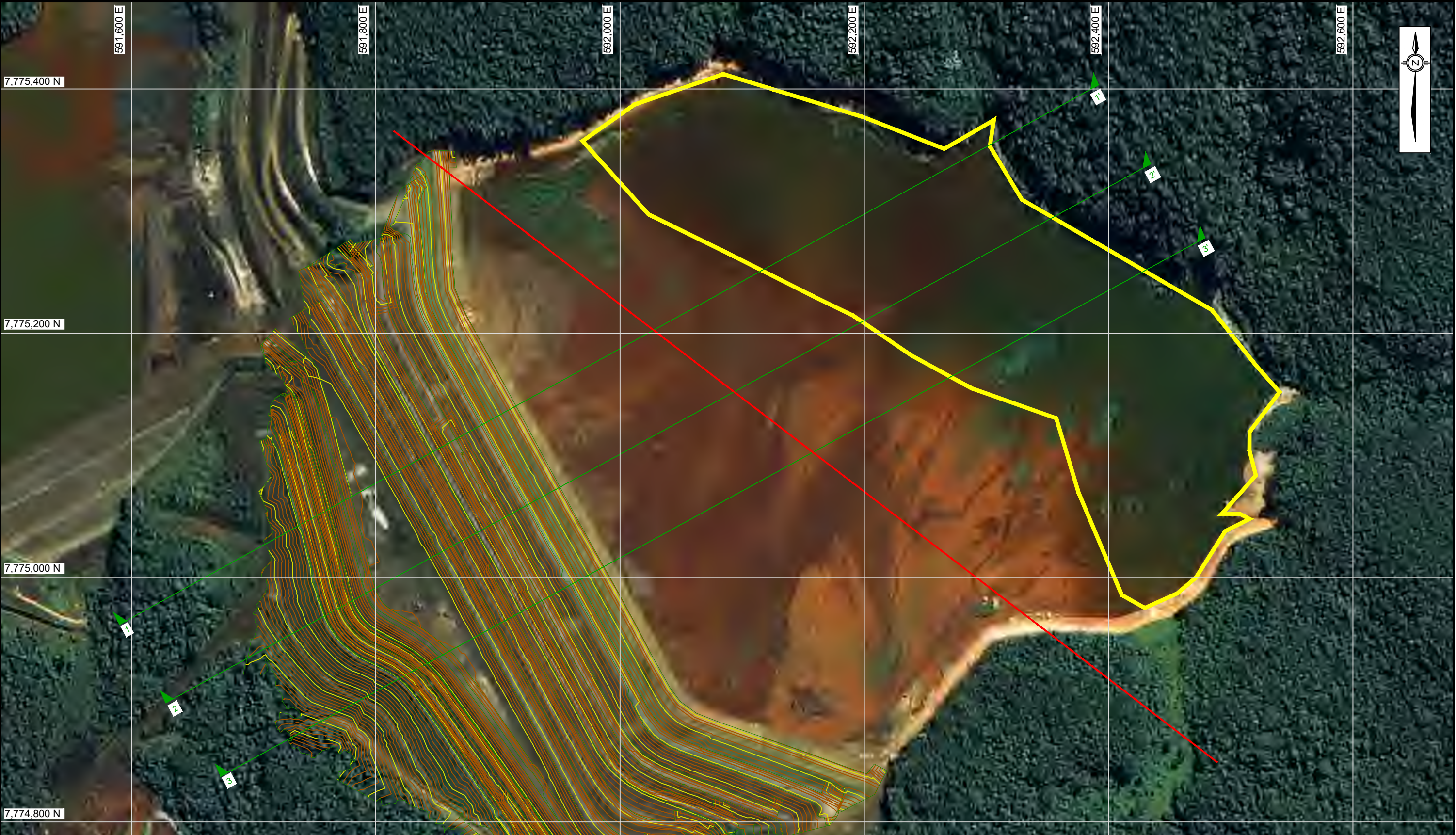
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
MARCH 30, 2008  
RAISE #14  
DAM CREST EL. 937 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-109 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

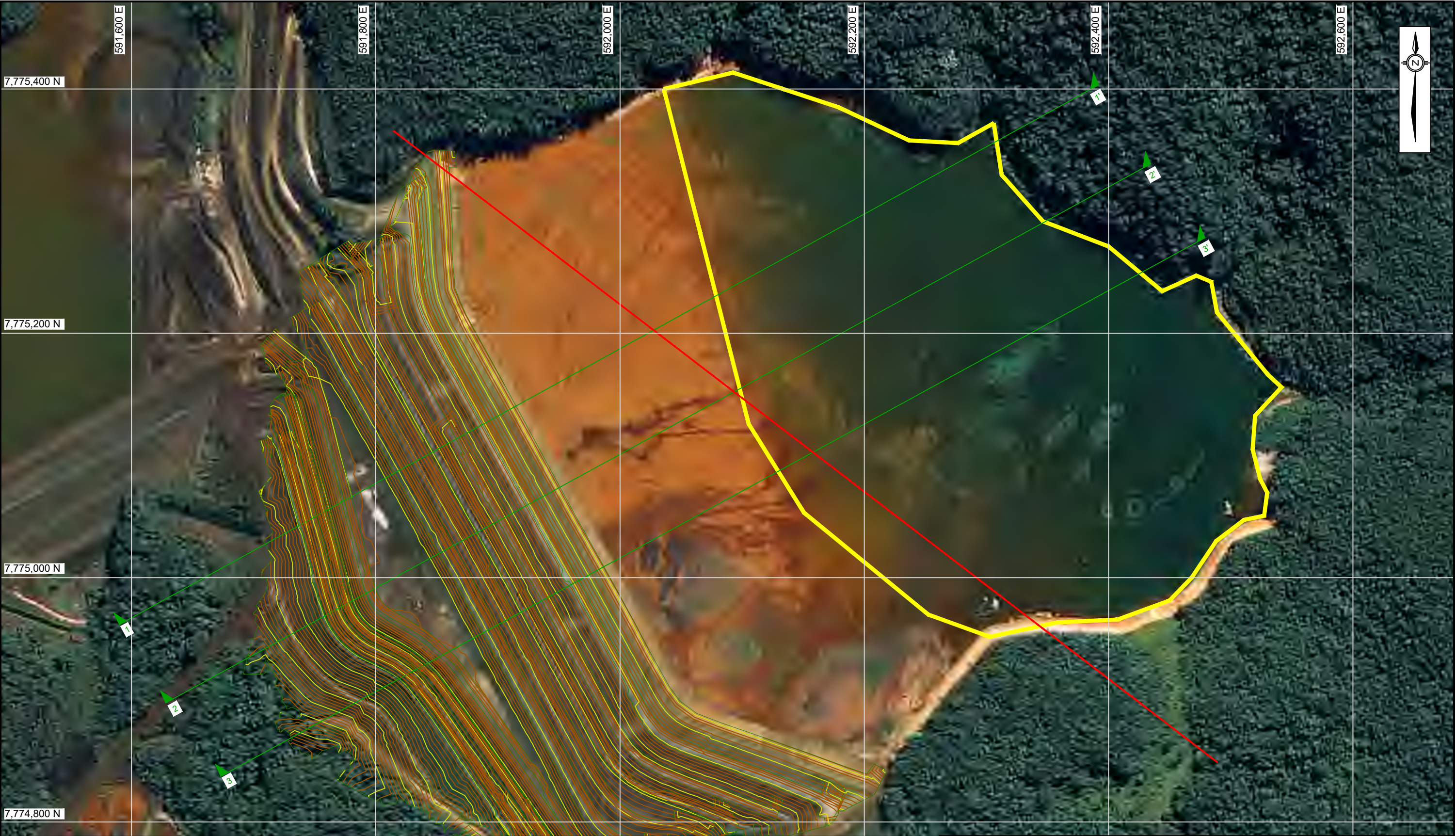
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                |                          |
|                                                                                                                       |                          |
|                                                                                                                       |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br>SATELLITE IMAGES<br>JUNE 6, 2008<br>RAISE #14<br>DAM CREST EL. 937 m                                         |                          |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-110                                                                                              |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

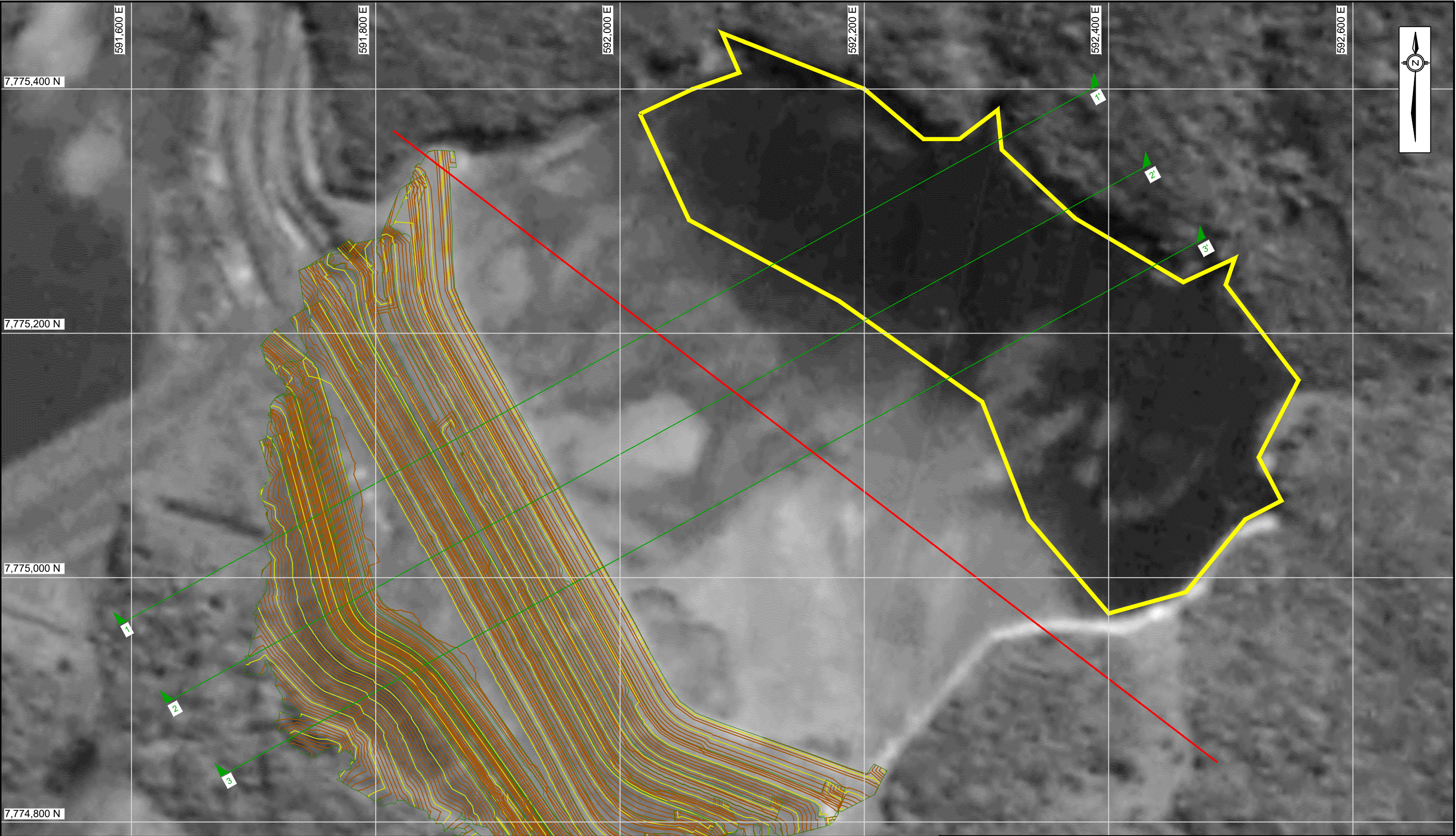
1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|        |  |
|--------|--|
| CLIENT |  |
|        |  |
|        |  |

|                                                                                                                          |                          |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------|
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF<br>THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br><b>SATELLITE IMAGES<br/>JULY 7, 2008<br/>RAISE #14<br/>DAM CREST EL. 937 m</b>                                  |                          |
| SCALE<br>1:3,000                                                                                                         | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-111                                                                                                 |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

CLIENT

PROJECT

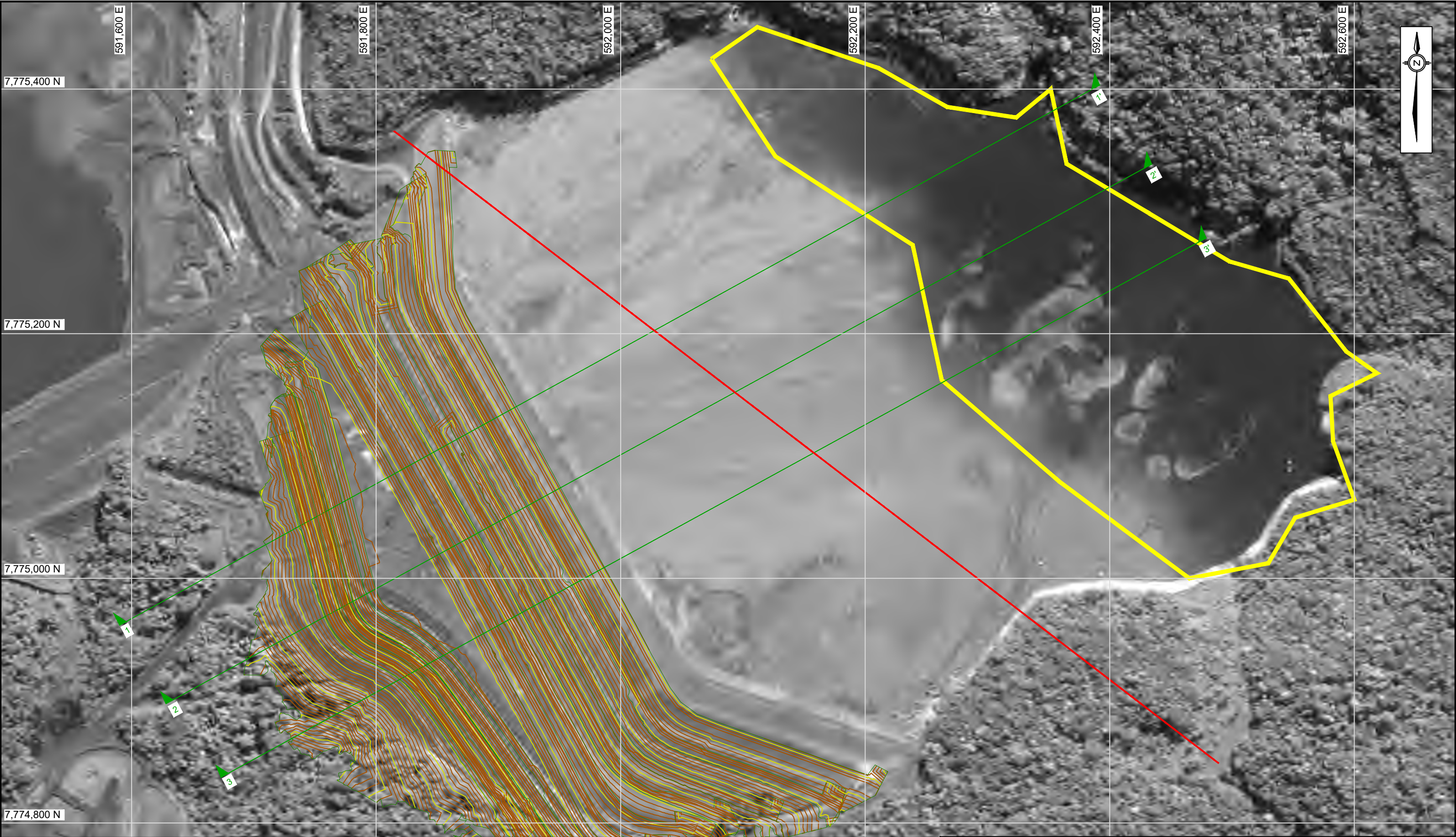
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE

**SATELLITE IMAGES**  
**APRIL 28, 2009**  
**RAISE #14**  
**DAM CREST EL. 937 m**

|         |             |              |
|---------|-------------|--------------|
| SCALE   | PROJECT No. | FIG. No.     |
| 1:3,000 | A03355A02   | FIGURE I-112 |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

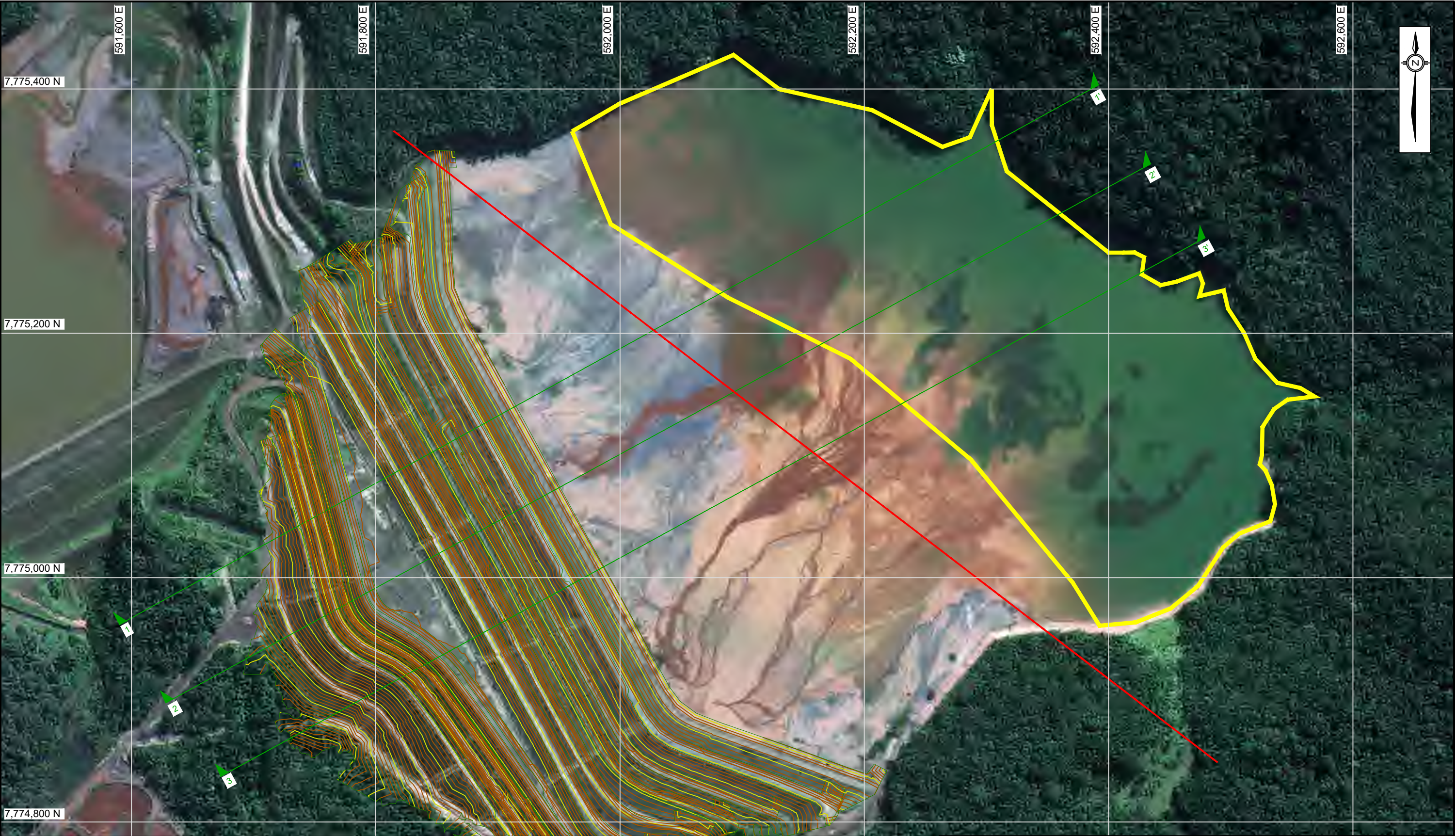
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                |                          |
|                                                                                                                       |                          |
|                                                                                                                       |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br>SATELLITE IMAGES<br>JULY 26, 2009<br>RAISE #14<br>DAM CREST EL. 937 m                                        |                          |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-113                                                                                              |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

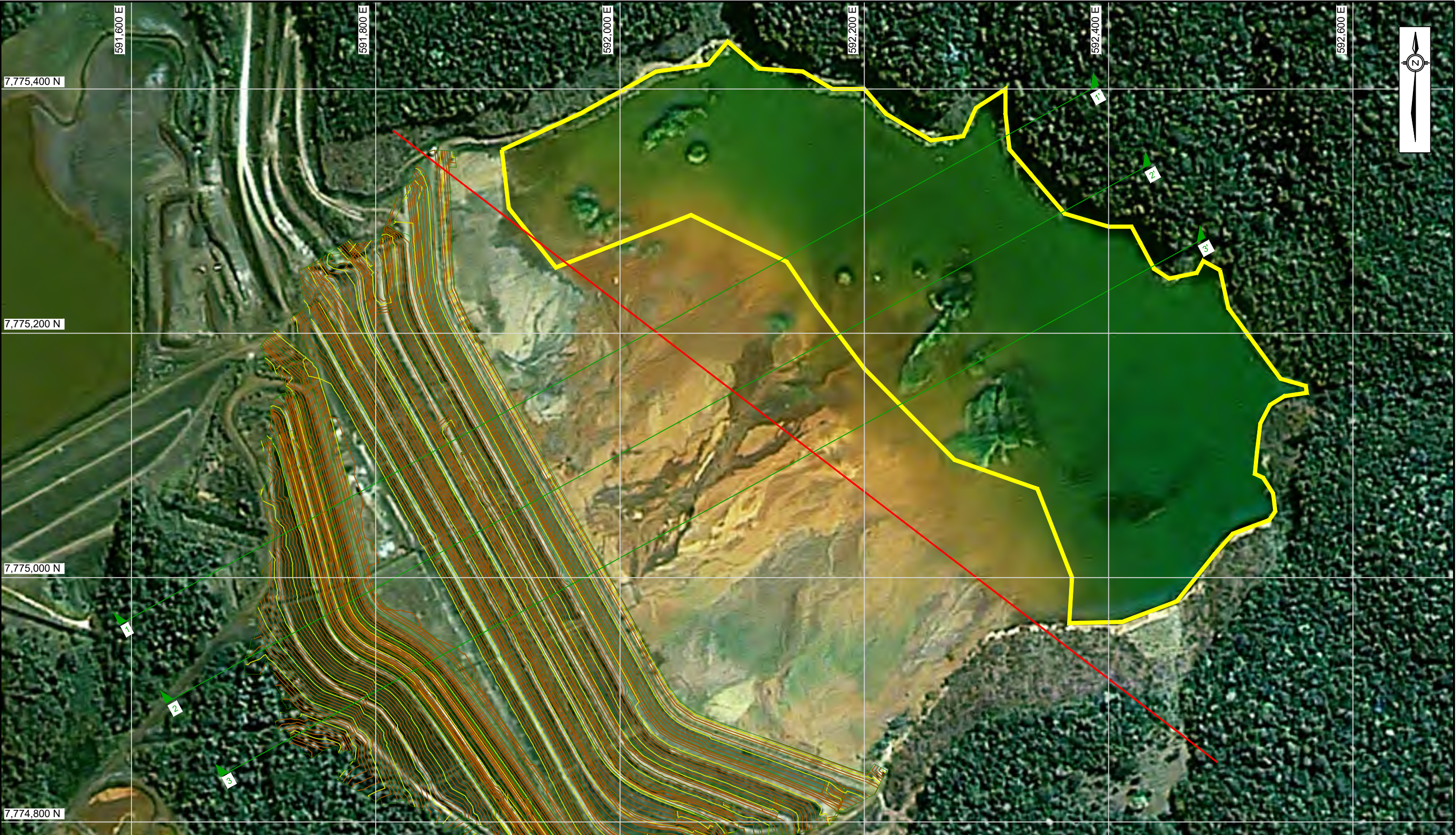
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
JUNE 13, 2010  
RAISE #14  
DAM CREST EL. 937 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-114 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

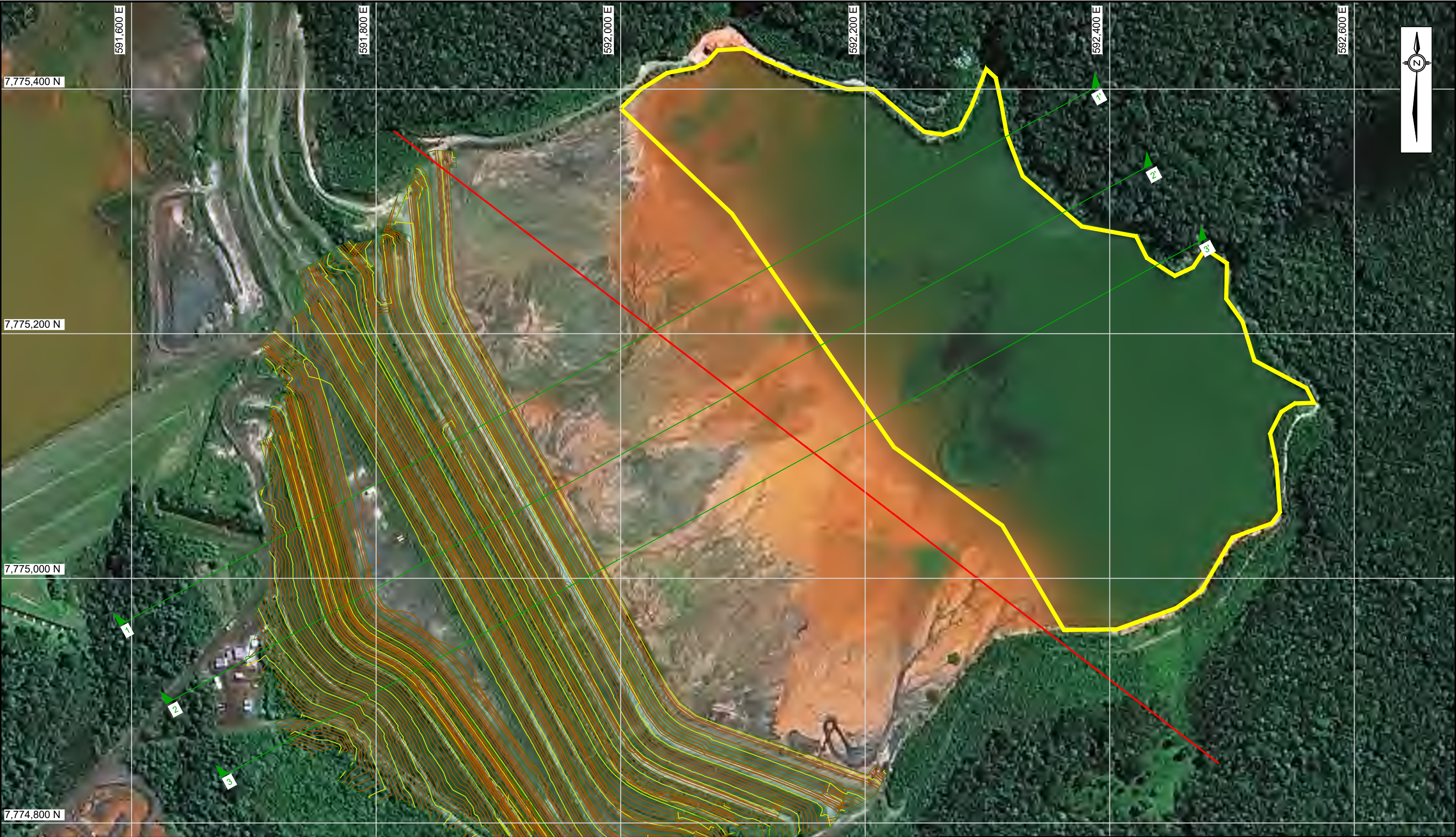
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
AUGUST 24, 2010  
RAISE #14  
DAM CREST EL. 937 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-115 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

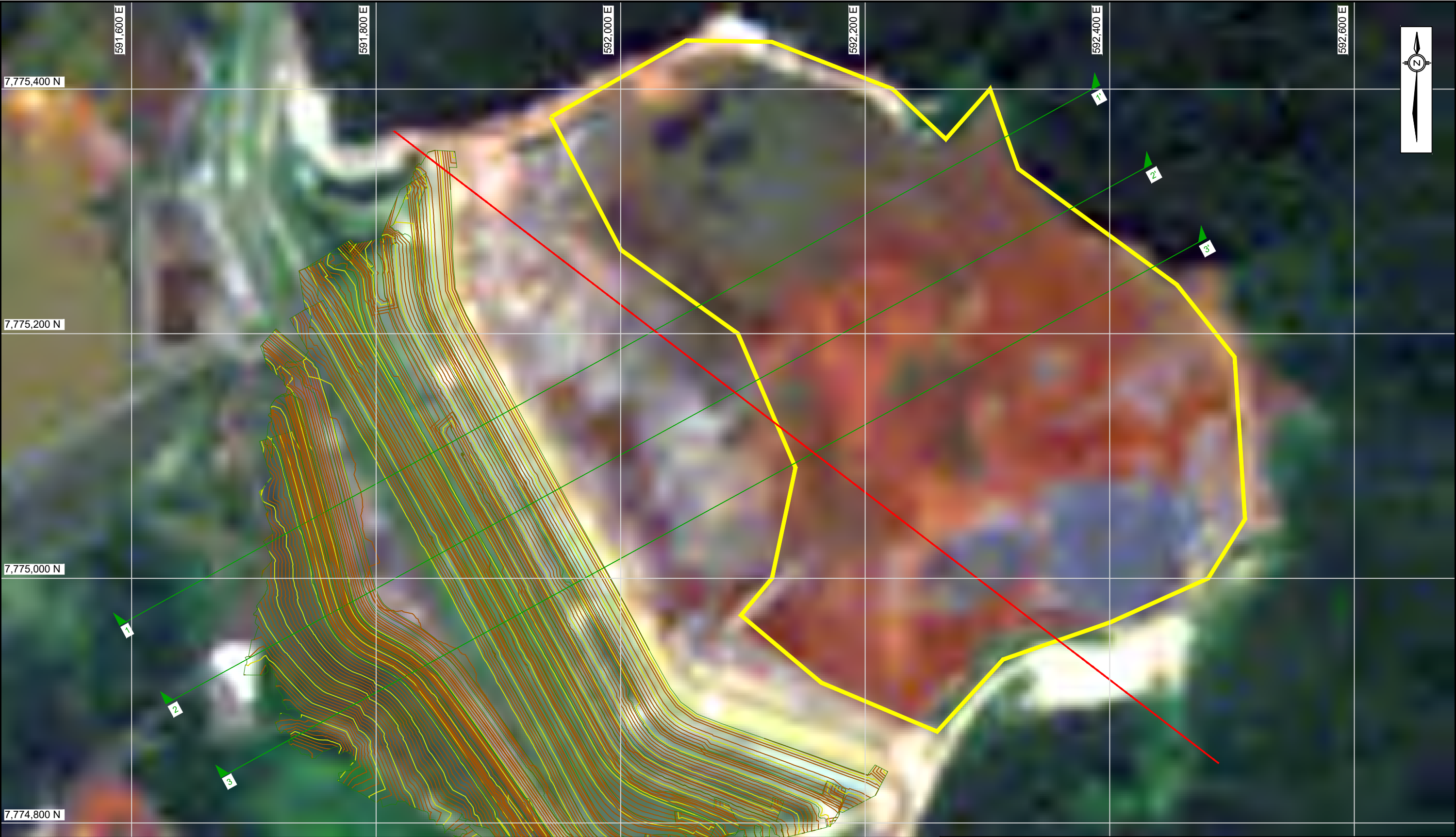
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |                          |
|------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                     |                          |
| PROJECT                                                                                                    |                          |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE                                                                                                      |                          |
| SATELLITE IMAGES<br>APRIL 10, 2012<br>RAISE #14<br>DAM CREST EL. 937 m                                     |                          |
| SCALE<br>1:3,000                                                                                           | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-116                                                                                   |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

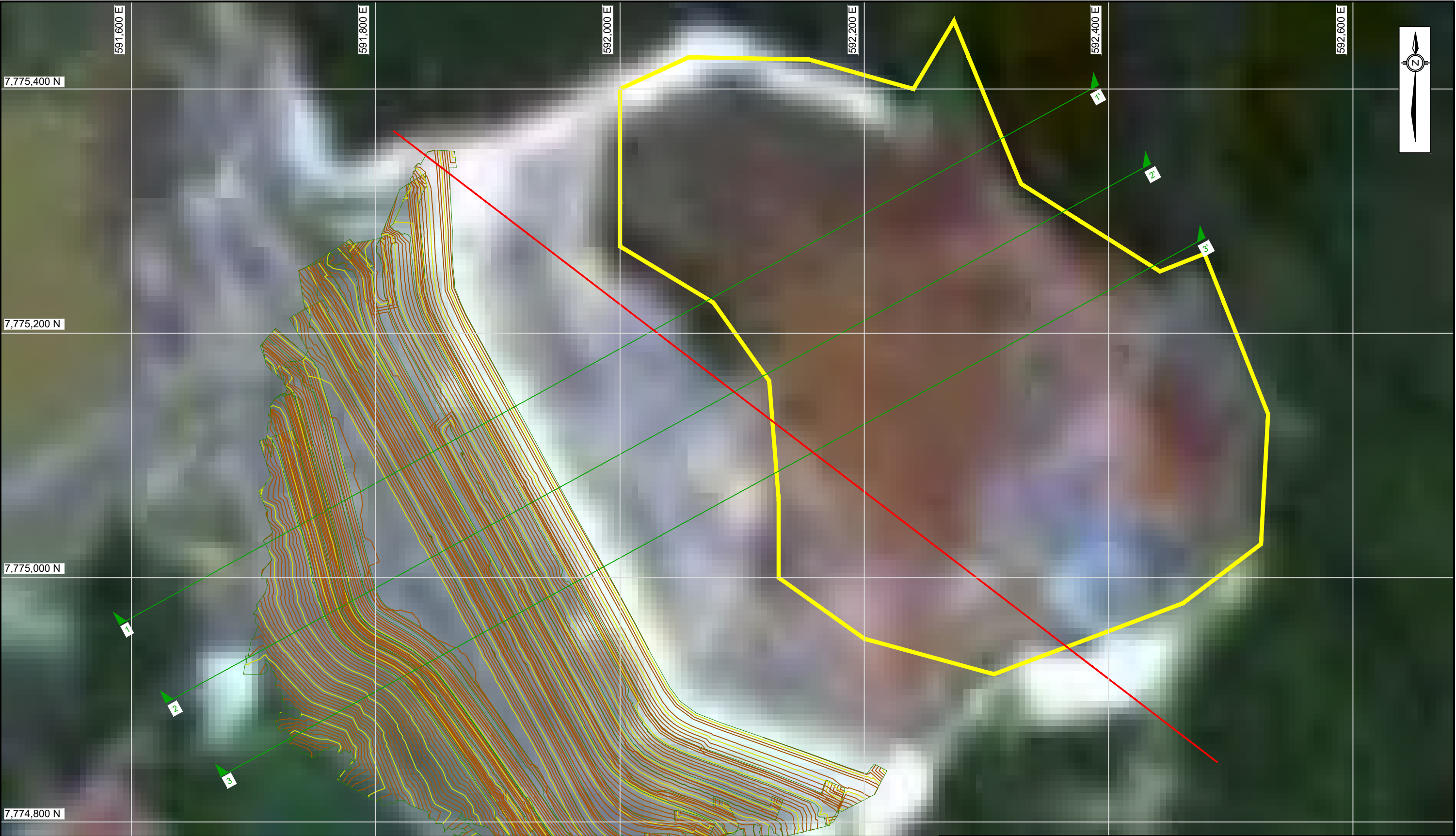
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                |                          |
|                                                                                                                       |                          |
|                                                                                                                       |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br>SATELLITE IMAGES<br>APRIL 27, 2013<br>RAISE #14<br>DAM CREST EL. 937 m                                       |                          |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-117                                                                                              |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

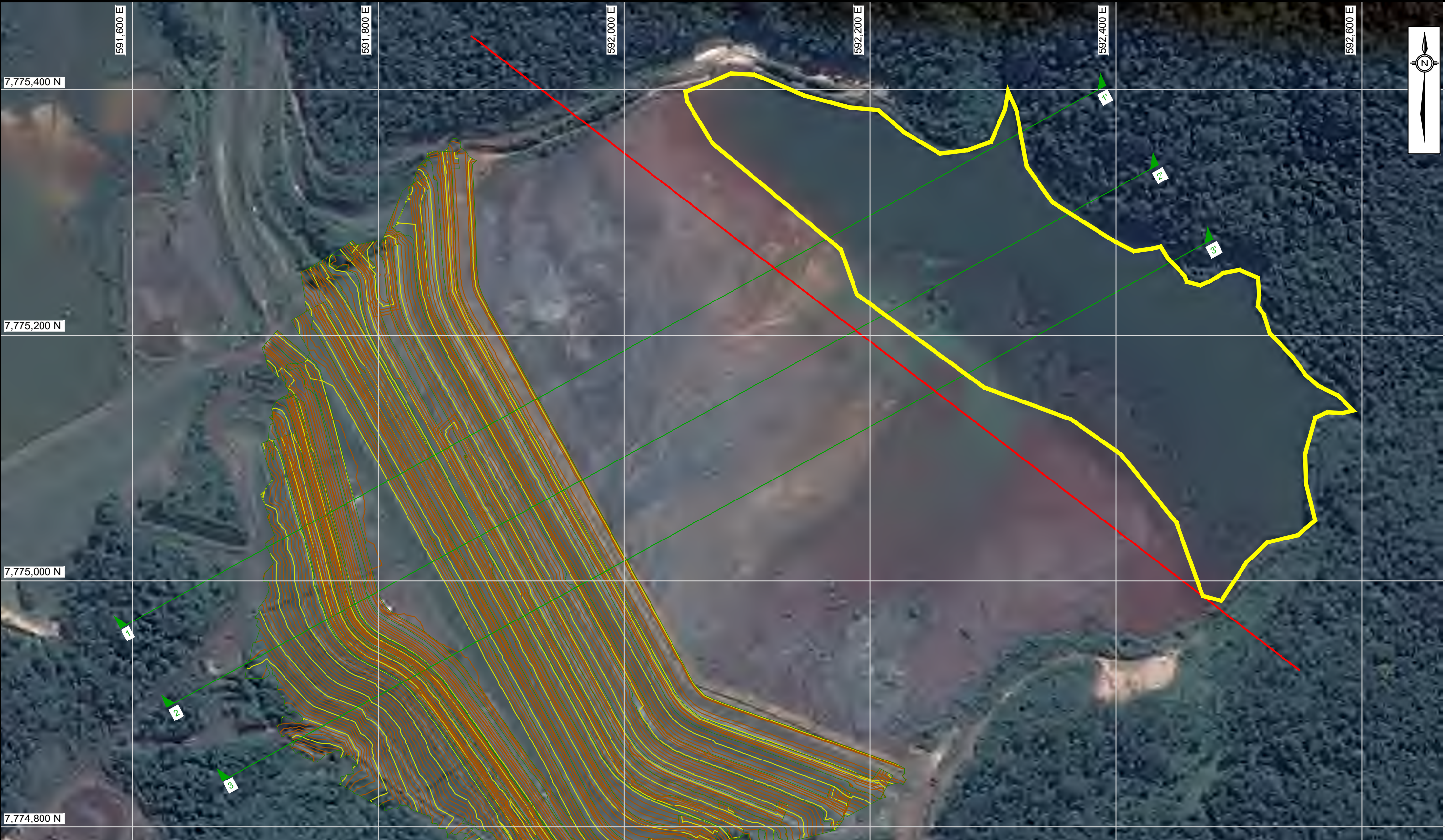
|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 14) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                                       |                          |
|-----------------------------------------------------------------------------------------------------------------------|--------------------------|
| CLIENT                                                                                                                |                          |
|                                                                                                                       |                          |
|                                                                                                                       |                          |
| PROJECT<br>REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |                          |
| TITLE<br><b>SATELLITE IMAGES<br/>SEPTEMBER 26, 2013<br/>RAISE #14<br/>DAM CREST EL. 937 m</b>                         |                          |
| SCALE<br>1:3,000                                                                                                      | PROJECT No.<br>A03355A02 |
| FIG. No.<br>FIGURE I-118                                                                                              |                          |





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 15) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

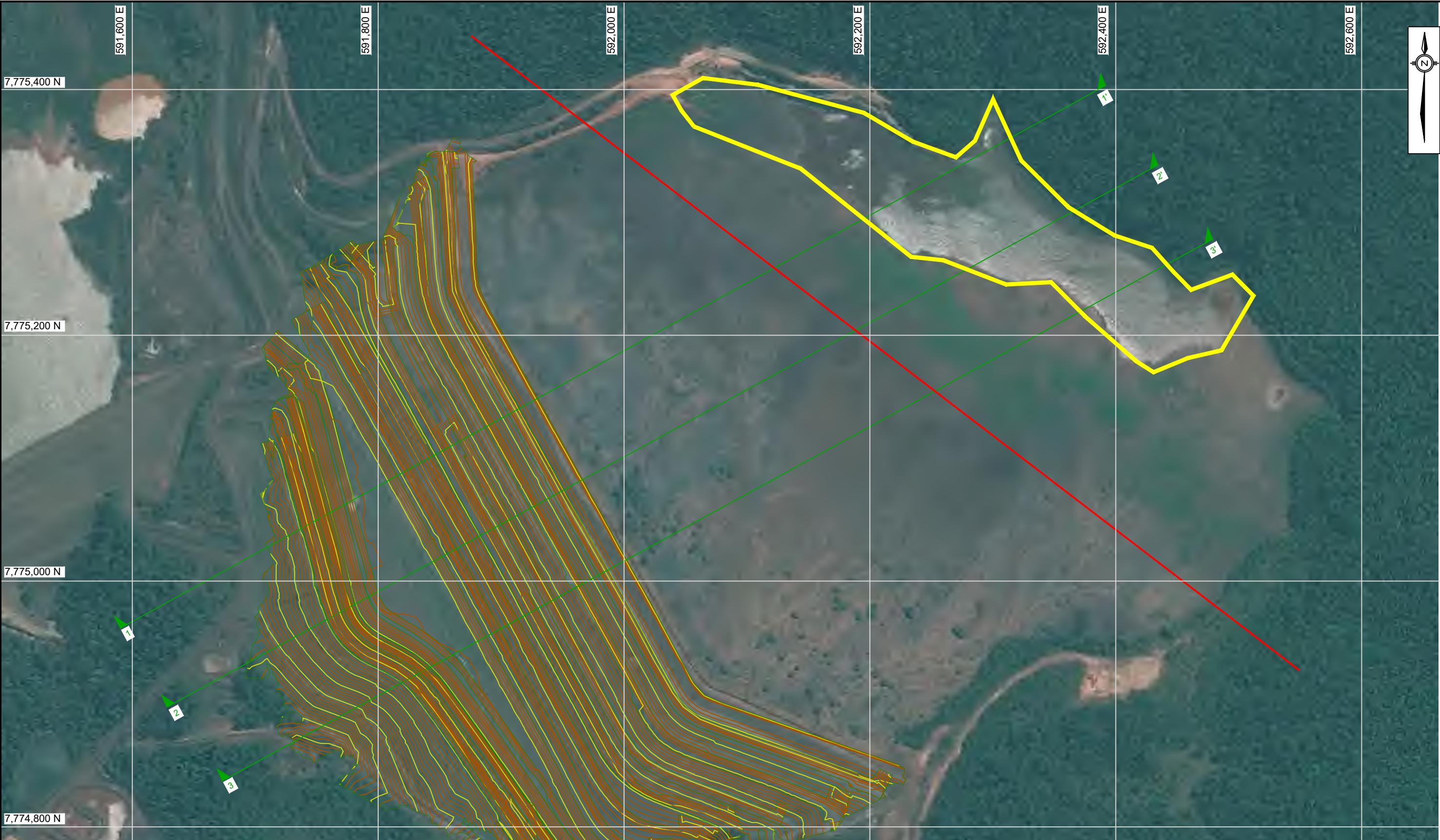
CLIENT

PROJECT  
REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF  
THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT

TITLE  
**SATELLITE IMAGES  
SEPTEMBER 11, 2016  
RAISE #15  
DAM CREST EL. 942 m**

|                  |                          |                          |
|------------------|--------------------------|--------------------------|
| SCALE<br>1:3,000 | PROJECT No.<br>A03355A02 | FIG. No.<br>FIGURE I-119 |
|------------------|--------------------------|--------------------------|





**NOTES:**

- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS STATED OTHERWISE.
- ALL COORDINATES AND ELEVATIONS ARE REFERENCED TO UTM SIRGAS2000 ZONE 23S.
- ALL SUPPLEMENTARY SATELLITE IMAGES WERE PROVIDED BY GeoApp. IMAGES USED IN THE ORIGINAL ASSESSMENT WERE PROVIDED BY PhotoSat.
- IMAGES WITH (S) IN THE TITLE REFER TO THE 90 IMAGES PROVIDED AS PART OF THE SUPPLEMENTARY ASSESSMENT. IMAGES WITHOUT (S) WERE USED IN THE INITIAL ASSESSMENT.

**LEGEND:**

|                                              |                   |
|----------------------------------------------|-------------------|
| DESIGN SECTIONS                              | 1 m CONTOURS      |
| POND OUTLINE                                 | 5 m CONTOURS      |
| MODELED POND BOUNDARY (AVERAGE FOR RAISE 15) | DAM RAISE OUTLINE |

1:3,000 30 60

BASED ON A 11"X 17" DRAWING SIZE

|                                                                                                            |             |
|------------------------------------------------------------------------------------------------------------|-------------|
| CLIENT                                                                                                     |             |
|                                                                                                            |             |
|                                                                                                            |             |
| PROJECT                                                                                                    |             |
| REPORT OF THE EXPERT PANEL ON THE TECHNICAL CAUSES OF THE FAILURE OF FEIJÃO DAM 1- SUPPLEMENTAL ASSESSMENT |             |
| TITLE                                                                                                      |             |
| SATELLITE IMAGES<br>OCTOBER 9, 2016<br>RAISE #15<br>DAM CREST EL. 942 m                                    |             |
| SCALE                                                                                                      | PROJECT No. |
| 1:3,000                                                                                                    | A03355A02   |
| FIG. No.                                                                                                   |             |
| FIGURE I-120                                                                                               |             |