

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



FOR OGCC USE ONLY

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

Spill Complaint
Inspection ☒ NOAV

Tracking No: Remediation #5132

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

Spill or Release Plug & Abandon Central Facility Closure Site/Facility Closure Other (describe): _____

OGCC Operator Number: _____	Contact Name and Telephone: _____
Name of Operator: _____	_____
Address: _____	No: _____
City: _____ State: _____ Zip: _____	Fax: _____
API Number: _____	County: _____
Facility Name: _____	Facility Number: _____
Well Name: _____	Well Number: _____
Location: (QtrQtr, Sec, Twp, Rng, Meridian): _____ Latitude: _____ Longitude: _____	

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): _____

Site Conditions: Is location within a sensitive area (according to Rule 901e)? Y N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): _____

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: _____

Potential receptors (water wells within 1/4 mi, surface waters, etc.): _____


Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):	Extent of Impact:	How Determined:
Soils	_____	_____
Vegetation	_____	_____
Groundwater	_____	_____
Surface Water	_____	_____


REMEDIALTION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Describe how source is to be removed:



Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:



FORM
27
Rev 6/99

State of Colorado
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Tracking Number: _____
Name of Operator: OXY
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: Location ID# 334537

Page 2
REMEDIATION WORKPLAN (Cont.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

The groundwater will be monitored via the remediation well structures described on the previous page. Seasonal fluctuations in the groundwater elevation are anticipated to result in periods where no water exists within much of the remediation system, followed by periods of elevated flow due to spring runoff and agricultural irrigation raising the groundwater surface. Monitoring will consist of monthly groundwater and surface water (Grove Creek) samples collected every month for six months. When the groundwater table and the creek decrease or dry up, sampling will be suspended until sample collection is possible. When this situation occurs, sampling will be conducted monthly. Sample points will be the remediation well structures and identified groundwater seeps (identified on Figure 1) and a downgradient location on Grove Creek. This will result in cross gradient, in plume and down gradient sample points in groundwater and the creek. Analytical will consist of BTEX and field water quality parameters including Dissolved Oxygen. Groundwater depth will be measured during sampling to compare fluctuations in BTEX concentrations and groundwater elevation. Following the initial pilot test, sampling will be done quarterly at a minimum.

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing. Use additional sheet for description if required.

See previous Form 27.

need Table 910-1 -
all; several metals
exceed gw stds

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☒ Y ☐ N If yes, describe:

The installation of upgradient, cross and down gradient groundwater monitoring wells will be evaluated as the remediation and monitoring of the impacts continue, depending on the trending of source concentrations in surface waters of Grove Creek and in ongoing groundwater samples from existing remediation wells.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

See previous Form 27

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: <u>7/12/2010</u>	Date Site Investigation Completed: <u>on-going</u>	Date Remediation Plan Submitted: <u>3/9/2011</u>
Remediation Start Date: <u>7/17/2010</u>	Anticipated Completion Date: <u>pending</u>	Actual Completion Date: _____

I hereby certify that the statements made in this form are, to the best of my knowledge, true, correct, and complete.

Print Name: Sean T. Norris

Signed: [Signature]

Title: Regulatory Lead

Date: 3/14/2011

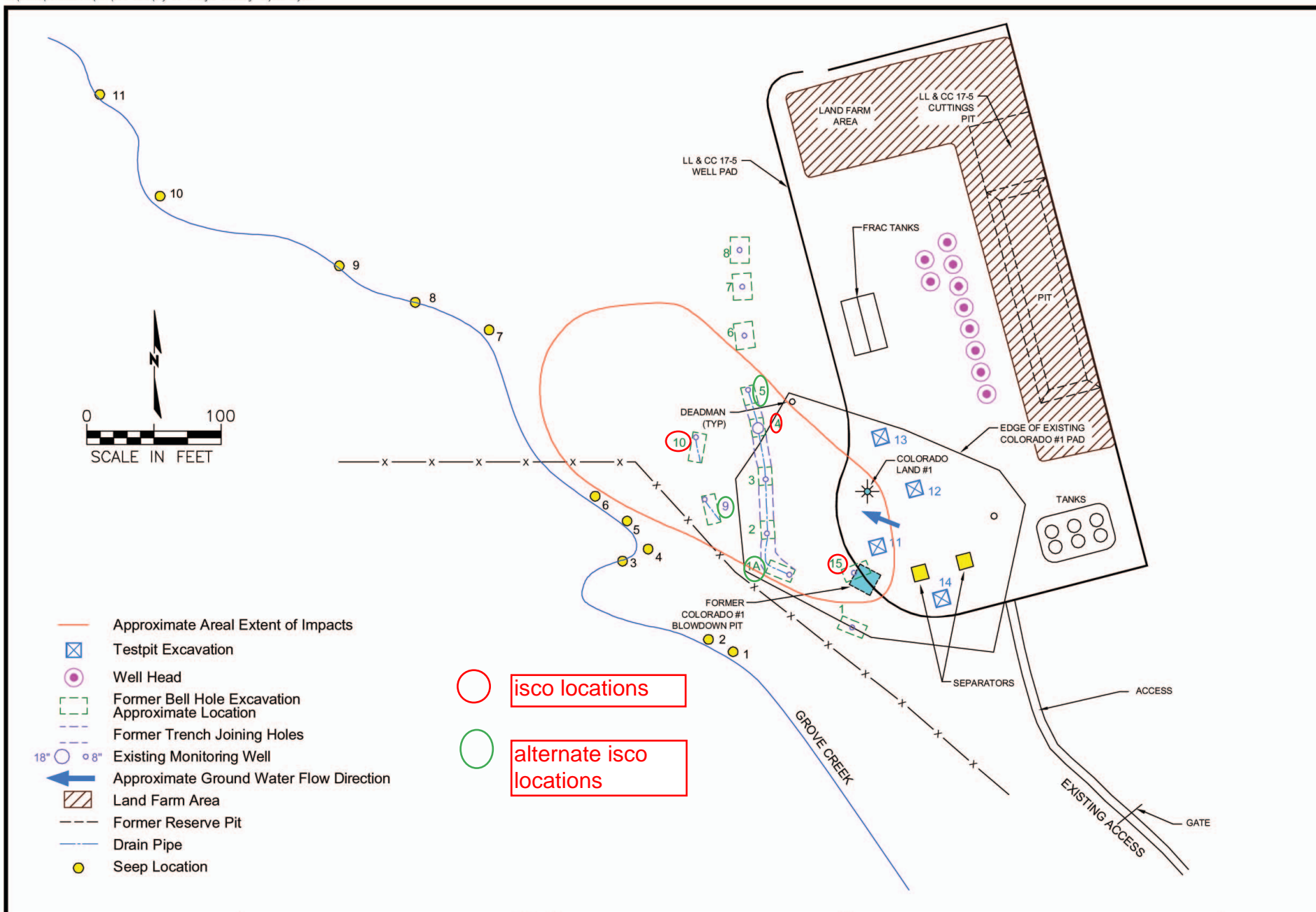
OGCC Approved: [Signature]

Title: FOR Alex Fischer

Date: 02/07/2013

Revised Form 27
See comments at
the end.

Supervisor,
Western Region



PROJECT NO: 010-1708

DRAWN BY: FR

DATE: 8/19/10

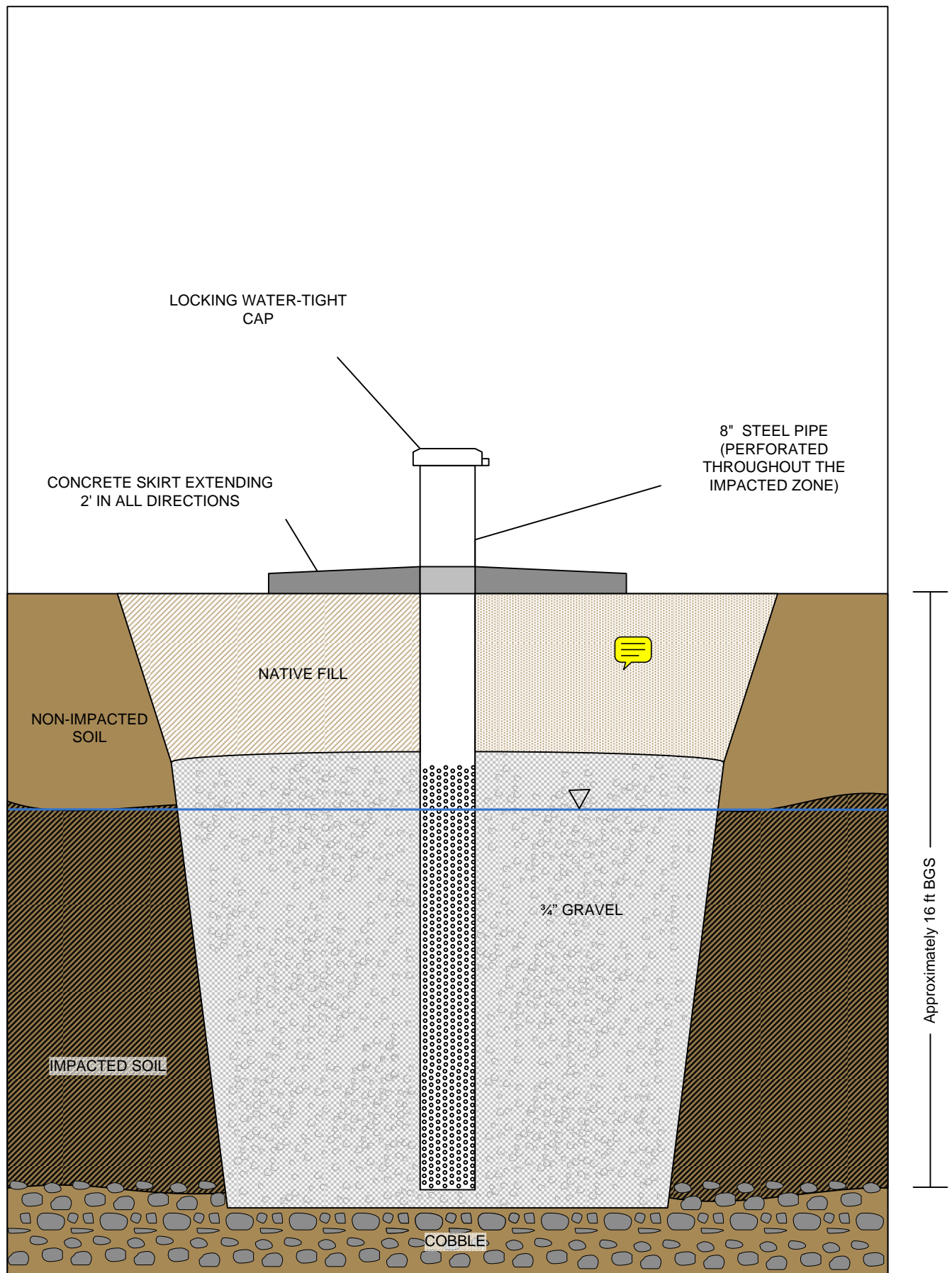
Site Map
OXY Laramie Land and Cattle 17-5
SW1/4 NW1/4 Section 17 T10S R94W
Mesa County, Colorado

OLSSON
ASSOCIATES

4690 Table Mountain Drive
Suite 200
Golden, CO 80403
TEL 303.237.2072
FAX 303.237.2659

FIGURE

1



PROJECT NO: 010-1708

DRAWN BY: KLK

DATE: 10/20/10

#1 Remediation Well Construction

OLSSON
ASSOCIATES

826 21½ Road
Grand Junction, CO 81505
TEL 970.263.7800
FAX 970.263.7456

FIGURE

2

yellow highlights exceed groundwater standards (methane yellow=detections)

* Taken from COGCC Table 910-1
 * Data Not Collected
 <### - Not detected
 NT - Analysis not requested

Linda Spry O'Rourke's Comments.
03/15/2011

Page 1. Describe how remediation ...

"need remediation system diagrams and iSOC technical specifications"

"did they excavate source to remove it? There was a source in place last summer....."

Page 2. If groundwater has been impacted...

"Need Table 910-1 – all; several metals exceed GW stds."

Page 2. Final Disposition of E&P waste

"Oct 2010 Form 27 does not include E&P waste disposition"

Figure 2. #1 Remediation Well Construction

"No cement, no grout, no sanitary seal"

7/12/2010 Impact identified

7/19/2010 NOAV issued

7/20/2010 Initial Form 27 Rem 5132

- clarifies contact date of 7/13/2010, not 7/12/2010
- believes Colorado Land #1 location is source
- booms
- samples
- bell holes dug
- plan-connect bellholes to interception trench,
vacuum water out of interceptor trench
- second interceptor trench between bell holes and creek will be installed
- soils will be landfarmed on LL&CC 17-5 pad
- water and material in frac tank same pad till characterization
- delination of vertical and horizontal extent will allow.....
- plan to abandon subsurface portions of system in place
- includes diagram with second interceptor trench

7/20/2010 verbal approval for interceptor trench

7/21/2010 - date on workplan loaded into laserfiche with rem 5132

7/21/2010 form 19 2607961 - says Oxy identified spill on 7/12/2010
form 19 and topo map in laserfiche associated with NOAV 200262741

7/23/2010 - email regarding waste management plan needed

7/26/2010 phone message

- research project - may not be done by abatement date
- submit what they have and let us know still looking
- evaluate all potential sources, even though suspect older well

7/30/2010 Form 27 -5132 saved in directory but is 7/20/2010 file

8/4/2010 - abatement date

8/20/2010 - I picked up hardcopy NOAV response at OXY's office
-----find this and get uploaded-----

8/25/2010 - emailed asking when CD for electronic version of NOAV response would arrive

8/31/2010 - received CD with electronic version

9/20/2010 phone notes (loaded into laserfiche with rem 5132)

- Colo Land & Cattle #1 well MIT - passed
 - line integrity testing - flow and dump lines - passed
 - confident not current wells or previous pits for source, but is old well
 - reported current results, I took notes on figure
- WQCC has not issued injection permits as wells not constructed properly
therefore, can't inject pumped/treated water into them

-considering ISOC for remediation - compressed O2 to strip vocs out

9/23/2010 email (loaded to laserfiche rem 5132) -how to keep contaminants out of stream since injection pit is hung up and approved Form 27 hinged on pumping from trench and reinjecting up/at source area

10/01/2010 Update form 27

- flow line integrity testing done
- MIT test passed
- will install three ISOC systems at locations 4, 10, and 15 (bell holes turned monitoring wells)
- will move periodically to locations 1a,5,9
- quarterly sampling
- implementation schedule is street address

10/15/2010 site visit photo

3/14/2011 COGCC Binder (Update Form 27)

- bell holes closed, remediation wells installed
- source produced water/condensate from 1992 spill or former blowdown tank
- don't think a source still exists
- conducting pilot test with 3 ISCO
- monthly groundwater and surface water sampling for six months during pilot test
- BTEX and field water quality params including dissolved oxygen
- after pilot test, quarterly sampling at a minimum

COGCC comments

- need more analysis, not just BTEX
 - data shows elevated metals
- did waste management plan get submitted?
 - methane detected in many of the intial samples
 - need remediation system diagrams and isoc technical specs
 - how did source get removed? the pumping they did?